Setting the Standard With the
World's Most Valued Grinders.

605
ACCU - SHARP
AUTO-INDEX
SPIN / RELIEF
REEL MOWER GRINDER

This book consists of two manuals:

The OPERATORS MANUAL which contains all the information on operating and doing routine daily maintenance on this equipment.

The ASSEMBLY and SERVICE MANUAL which is used by the maintenance department to install the equipment and to do all maintenance except routine daily maintenance.

Setting the Standard With the World's Most Valued Grinders.

We are committed to:

Providing superior customer support, training, and service.

Manufacturing the highest quality products at an unequaled value.

Setting the industry standard by investing in technological product innovation.

Manufacturing products specifically designed to maintain original equipment manufacturers' specifications.

Interacting with and supporting all original equipment manufacturers.

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OPERATORS MANUAL

WARNING

You must thoroughly read and understand this manual before operating the equipment, paying particular attention to the Warning & Safety instructions.

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SAFETY INSTRUCTIONS

Safety Awareness Symbols are inserted into this manual to alert you to possible ***Safety Hazards***. Whenever you see these symbols, follow their instructions.

The ***Warning Symbol*** identifies special instructions or procedures which, if not correctly followed, could result in personal injury.

The ***Caution Symbol*** identifies special instructions or procedures which, if not strictly observed, could result in damage to or destruction of equipment.

1. **KEEP GUARDS IN PLACE** and in working order.
2. **REMOVE WRENCHES AND OTHER TOOLS.**
3. **KEEP WORK AREA CLEAN.**
4. **DON'T USE IN DANGEROUS ENVIRONMENT.** Don't use Grinder in damp or wet locations. Machine is for indoor use only. Keep work area well lit.
5. **KEEP ALL VISITORS AWAY.** All visitors should be kept a safe distance from work area.
6. **MAKE WORK AREA CHILD-PROOF** with padlocks or master switches.
7. **DON'T FORCE THE GRINDER.** It will do the job better and safer if used as specified in this manual.
8. **USE THE RIGHT TOOL.** Don't force the Grinder or an attachment to do a job for which it was not designed.
9. **WEAR PROPER APPAREL.** Wear no loose clothing, gloves, neckties, or jewelry which may get caught in moving parts. Nonslip footwear is recommended. Wear protective hair covering to contain long hair.
10. **ALWAYS USE SAFETY GLASSES.**
11. **SECURE YOUR WORK.** Make certain that the cutting unit is securely fastened with the clamps provided before operating.
12. **DON'T OVERREACH.** Keep proper footing and balance at all times.
13. **MAINTAIN GRINDER WITH CARE.** Follow instructions in Service Manual for lubrication and preventive maintenance.
14. **DISCONNECT POWER BEFORE SERVICING,** or when changing the grinding wheel.
15. **REDUCE THE RISK OF UNINTENTIONAL STARTING.** Make sure the switch is OFF before plugging in the Grinder.
16. **USE RECOMMENDED ACCESSORIES.** Consult the manual for recommended accessories. Using improper accessories may cause risk of personal injury.
17. **CHECK DAMAGED PARTS.** A guard or other part that is damaged or will not perform its intended function should be properly repaired or replaced.
18. **NEVER LEAVE GRINDER RUNNING UNATTENDED. TURN POWER OFF.** Do not leave grinder until it comes to a complete stop.
19. **KNOW YOUR EQUIPMENT.** Read this manual carefully. Learn its application and limitations as well as specific potential hazards.
20. **KEEP ALL SAFETY DECALS CLEAN AND LEGIBLE.** If safety decals become damaged or illegible for any reason, replace immediately. Refer to replacement parts illustrations in Service Manual for the proper location and part numbers of safety decals.
21. **DO NOT OPERATE GRINDER WHEN UNDER THE INFLUENCE OF DRUGS, ALCOHOL, OR MEDICATION.**

SAFETY INSTRUCTIONS

IMPROPER USE OF GRINDING WHEEL MAY CAUSE BREAKAGE AND SERIOUS INJURY.

Grinding is a safe operation if the few basic rules listed below are followed. These rules are based on material contained in the ANSI B7.1 Safety Code for "Use, Care and Protection of Abrasive Wheels". For your safety, we suggest you benefit from the experience of others and carefully follow these rules.

DO

1. **DO** always **HANDLE AND STORE** wheels in a **CAREFUL** manner.
2. **DO VISUALLY INSPECT** all wheels before mounting for possible damage.
3. **DO CHECK MACHINE SPEED** against the established maximum safe operating speed marked on wheel.
4. **DO CHECK MOUNTING FLANGES** for equal and correct diameter.
5. **DO USE MOUNTING BLOTTERS** when supplied with wheels.
6. **DO** be sure **WORK REST** is properly adjusted.
7. **DO** always **USE A SAFETY GUARD COVERING** at least one-half of the grinding wheel.
8. **DO** allow **NEWLY MOUNTED WHEELS** to run at operating speed, with guard in place, for at least one minute before grinding.
9. **DO** always **WEAR SAFETY GLASSES** or some type of eye protection when grinding.

DON'T

1. **DON'T** use a cracked wheel or one that **HAS BEEN DROPPED** or has become damaged.
2. **DON'T FORCE** a wheel onto the machine **OR ALTER** the size of the mounting hole - if wheel won't fit the machine, get one that will.
3. **DON'T** ever **EXCEED MAXIMUM OPERATING SPEED** established for the wheel.
4. **DON'T** use mounting flanges on which the bearing surfaces **ARE NOT CLEAN, FLAT AND FREE OF BURRS.**
5. **DON'T TIGHTEN** the mounting nut excessively.
6. **DON'T** grind on the **SIDE OF THE WHEEL** (see Safety Code B7.2 for exception).
7. **DON'T** start the machine until the **WHEEL GUARD IS IN PLACE.**
8. **DON'T JAM** work into the wheel.
9. **DON'T STAND DIRECTLY IN FRONT** of a grinding wheel whenever a grinder is started.
10. **DON'T FORCE GRINDING** so that motor slows noticeably or work gets hot.

AVOID INHALATION OF DUST generated by grinding and cutting operations. Exposure to dust may cause respiratory ailments. Use approved NIOSH or MSHA respirators, safety glasses or face shields, and protective clothing. Provide adequate ventilation to eliminate dust, or to maintain dust level below the Threshold Limit Value for nuisance dust as classified by OSHA.

GETTING TO KNOW YOUR GRINDER

This machine is intended for reel mower reel blade grinding ONLY.
Any use other than this may cause personal injury and void the warranty.

To assure the quality and safety of your machine and to maintain the warranty, you MUST use original equipment manufactures replacement parts and have any repair work done by a qualified professional.

ALL operators of this equipment must be thoroughly trained BEFORE operating the equipment.

Do not use compressed air to clean grinding dust from the machine. This dust can cause personal injury as well as damage to the grinder.

Adjustable Reel Clamping Mechanisms for ease of installation. Two chain vise grips included to secure any size roller.

Positive Vertical and Horizontal Reel Adjustments for fast alignment of the reel in the machine.

Dial Indicator Setup Gauge to align reels with accuracy up to .001".

Accessible Control Panel with independent switches for grinding motor, carriage traverse with variable speed control, spin drive with variable speed control, and a safety stop button.

Positive Infeed and Height Adjustment for exact positioning of the reel and measured metal removal.

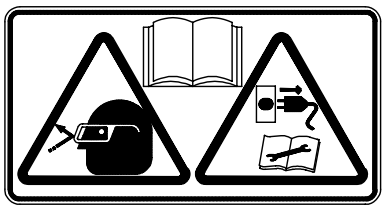
Electro-Magnetic Traversing Switch for easily adjustable traversing length.

FIG. 1

SPECIFICATIONS

Traversing Switches	Solid state, non-contacting proximity switches
Carriage Travel	45"[115 cm]
Overall Width	79.5"[202 cm]
Overall Height	83"[211 cm]
Overall Depth	48.5"[124 cm]
Weight	1290 lbs[585 kg]
Base Construction	Precision Machined heavy duty reinforced welded steel base
Carriage Rails	Precision Ground, Hardened Steel 1.000 Dia. [25.4 mm]
Grind Head Motor	3/4 HP at 60 HZ, 5/8 HP at 50 HZ, 3450 RPM at 60 HZ, 2875 RPM at 50 HZ
Elevator	400 lbs. [180 kg] capacity
Spin Drive	Reversible variable speed 0-380 RPM DC Gear Motor .20 Hp
Sound Level	More than 75 Dba, Less than 95 Dba
Auto Traverse	Belt drive with built in overload protection
Grinding Head	90 degrees rotatable head with pin lock locations for grinding bedknives
Rail covers	Telescoping bellows
Control System	Reversible Spin drive with variable spin speed or variable relief torque
Control System	Door safety interrupt switches and variable traverse speed control

GETTING TO KNOW YOUR GRINDER (Continued)



Symbols for Read operators manual, wear safety glasses and disconnect power before servicing.

Symbol to keep visitors a safe distance away from the grinder.

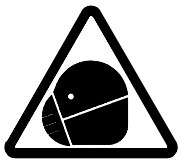
Symbol for sharp object which will cause serious injury.

Symbol for hot surface which could cause burns.

Symbol for caution relating to RPM of the motor and minimum safe rated RPM of the grinding wheel.

Symbol identifying a panel, cover, or area as having live electrical components within.

Symbol for hearing protection required when operating this machine



Symbol that operators and people in the close proximity must wear respirators or have adequate ventilation systems.

Symbol for maximum weight capacity for winch

Symbol to keep exposed gasoline or flammables away from the grinder because it operates with a large amount of sparks.

LOW VOLTAGE RELAY

The grinder is equipped with a low voltage relay which is factory preset at 100 VAC. If the power supply line does not deliver 100 VAC power under load, the relay will open and trip out the starter. If this occurs, your power supply line is inadequate and must be correct before proceeding further with the grinder.

DAILY MAINTENANCE BY THE OPERATOR

On a daily basis, clean the grinder by wiping it off.
On a daily basis, remove all grinding grit from the grinding head and bellows area.
On a daily basis, inspect the grinder for loose fasteners or components and tighten.
Contact your company's Maintenance Department if damaged or defective parts are found.

DO NOT USE COMPRESSED AIR TO CLEAN GRINDING DUST FROM THE GRINDER.

GETTING TO KNOW YOUR MACHINE

The following is an explanation of the machine components you will be using when setting up reels to grind on your new Spin Grinder. You should familiarize yourself with each part as this grinder has been engineered to spin and relief grind almost every type and make of reel mower available today. Adjustment of the various fixtures will be necessary for different types of reels.

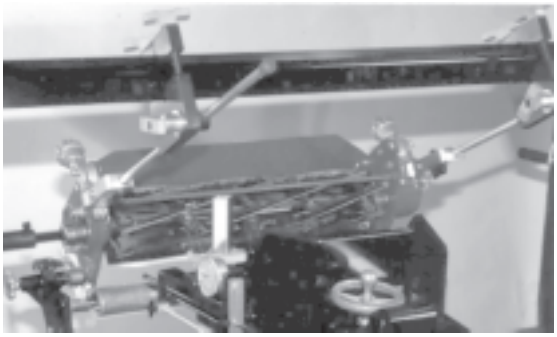


FIG. 2

OVERHEAD MOWER CLAMP ASSEMBLY

Each overhead mower clamp assembly consists of two rectangular bar clamps (top and bottom), which also contain adjustable holding fixtures into which is placed the mower clamps. These clamps will be positioned on the overhead square bar as shown in FIG. 2 and FIG 3. They are designed to lock into place and not move during the grinding procedure. Included are two sizes of clamp lips, normally the smaller will be used. Also included are two sets of clamp rods. Because of potential interference with the front doors we supply two long and two short clamp rods.

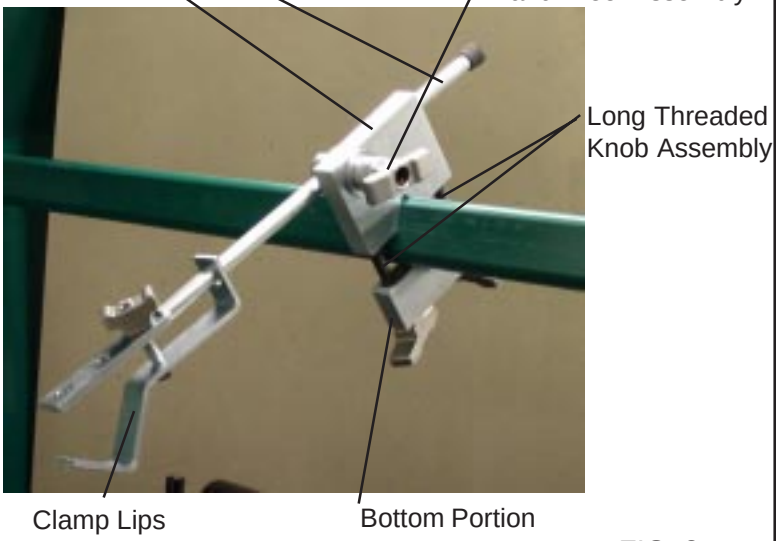


FIG. 3

ROLLER SUPPORTS

There are two roller supports that are mounted to the square mounting bar so that the "V" faces the back of the machine and the offset can be mounted high as pictured or low. The rooler brackets can also face upward with the offset either forward or to the rear. See FIG. 4.

THE HARD KNOBS ON THE SQUARE BAR MUST BE VERY TIGHT OR THE REEL CAN LOOSEN CAUSING POOR GRIND QUALITY.

FIG. 4

CENTER MOUNTING BRACKETS

The centers mounting brackets consist of a stationary center bracket and an adjustable center bracket. The stationary bracket will normally be used on the right hand side of the mounting bar when facing the reel loading position. See FIG. 5. These centering fixtures are used primarily on greens mowers and the **OPTIONAL** Bedknife Attach Kit 6000555.

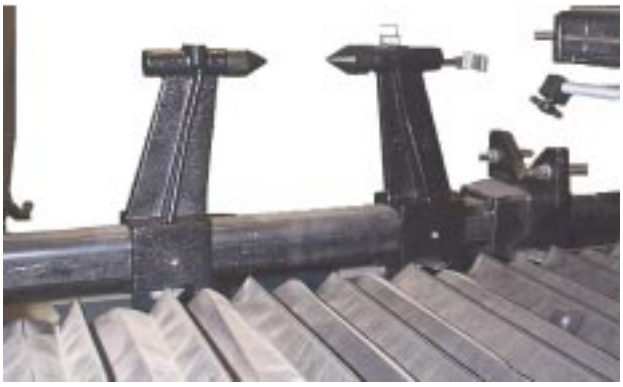


FIG. 5

OPTIONAL PULL GANG BRACKETS

The **OPTIONAL** Pull Gang Reel Mount Kit 18574 consists of a lower mounting bracket that fits over the square tooling mounting bar and two threaded locking screws. Attached to this is the upper "V" bracket that cradle the reel hub when in position. There are three vertical adjustments on this fixture, but will normally be used in the upper hole position. See FIG. 6.

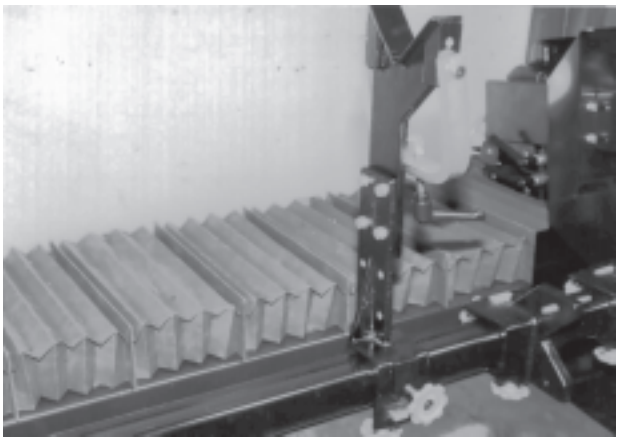


FIG. 6

These brackets can be mounted on the square mounting bar with offset either forward or backwards, but the normal position will be with the "V" centered over the bar or with the offset facing the back of the machine. The hold-down swing arm has an upper and lower mounting position depending on mower hub size.

The rear roller of the pull gang mowing unit attaches to the roller supports as shown in FIG. 7.

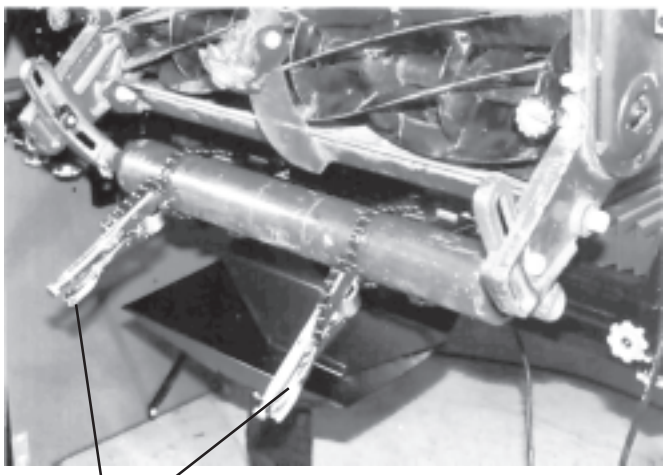


FIG. 7

TRAVERSE ACTUATOR RELEASE

The actuator that drives the grinding carriage left and right can be released to allow manual movement of the grinding carriage. The actuator release arm is located at the front of the carriage to the left of the infeed handwheel. See FIG. 8 and FIG. 9. Rotate the release arm upward to release actuator and down to engage actuator.

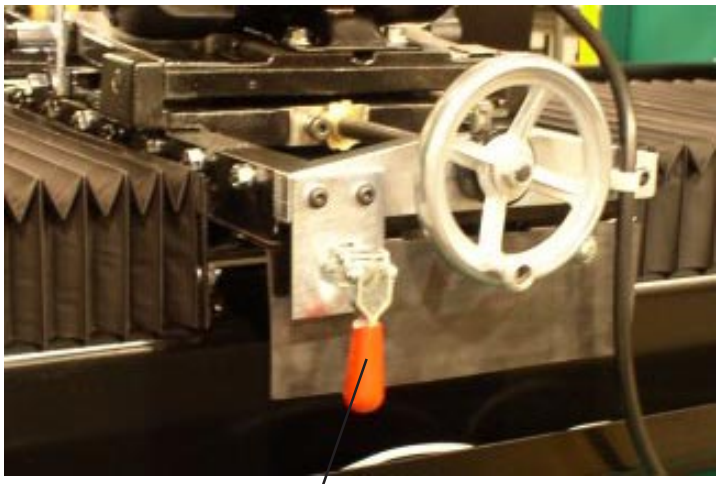


FIG. 8

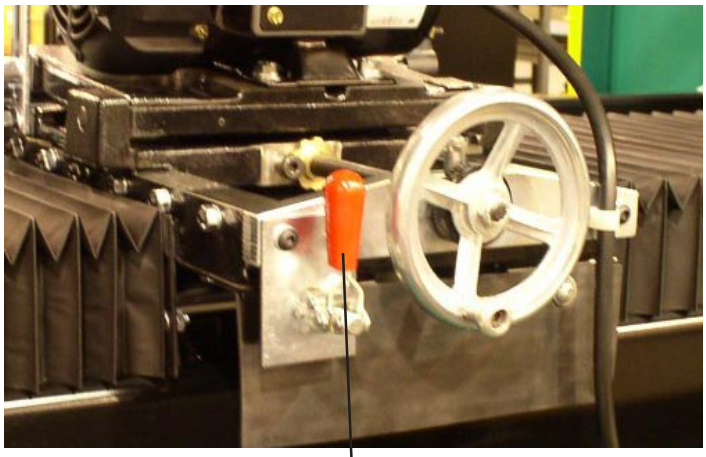


FIG. 9

PROXIMITY SENSORS

The Spin Relief Grinder is equipped with proximity sensors to change the traversing directions. These are adjustable by loosening the star knob and sliding them along the rail and retightening to control traverse distance. See FIG. 10.

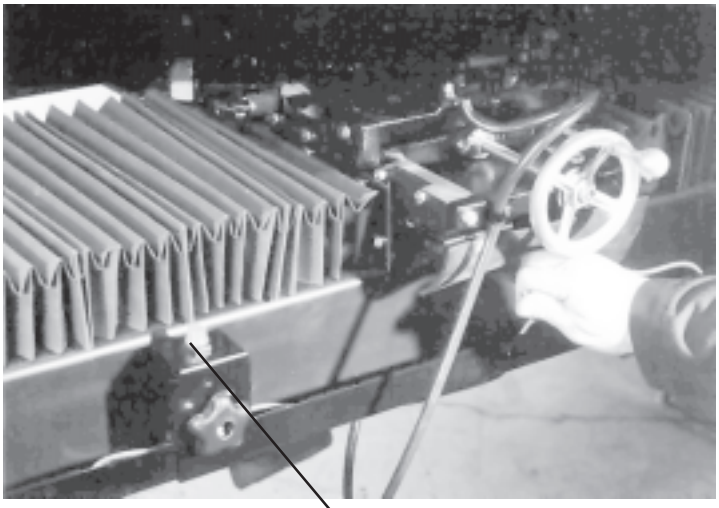


FIG. 10

GRINDING WHEEL AND GUARD FOR SPIN GRINDING

Spin grinding requires a 1.00" wide [25.4 mm] grinding wheel and a simple flat grinding wheel guard. See FIG. 11.

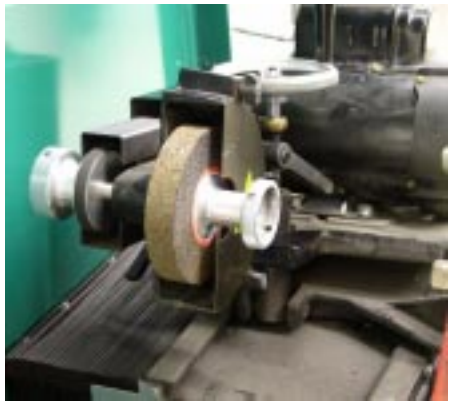


FIG. 11

GRINDING WHEEL AND FINGER - GUARD ASSEMBLY FOR RELIEF GRINDING

Relief grinding requires a 3/8" .375" [9.5 mm] grinding wheel and a wheel guard that carries the fixed relief finger and the moveable index finger. See FIG. 12.

FIG. 12

RELIEF GRINDING FINGER ADJUSTMENTS

The relief Index Finger Assembly has three adjustments as follows:

1. The index pin is adjustable in height with the loosening of its locking setscrew. The height of the finger can be raised to catch the next blade on small diameter reels or it can be lowered to avoid interference with the reel spider. See FIG. 13.

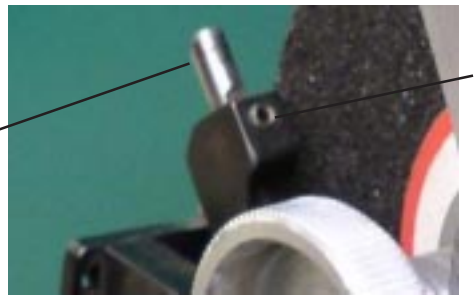


FIG. 13

2. The moveable finger has a knob to limit the amount of back travel. The back travel of the finger is limited so the reel blade makes a smooth transition from the moveable finger onto the fixed finger without interferences. The fixed finger is the working finger during the grind. See FIG. 14.

FIG. 14

3. The lock handle on the side of the guard/carrier plate is an adjustment for grinding wheel wear. Use this to hold the fingers in the correct position to the grinding wheel. See FIG. 15.

FIG. 15

DIAL INDICATOR SET UP FIXTURE

The dial indicator set up fixture is designed to be quickly mounted into position and/or quickly removed.

The fixture is mounted to the front left corner of the grinding head assembly as shown in FIG. 16.

When the fixture is not in use, it is quickly removed and can be stored on the tool tray.

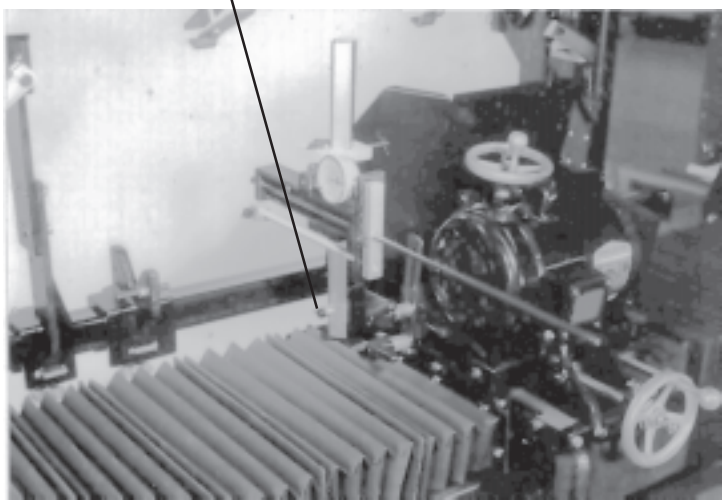


FIG. 16

CONTROL PANEL

The control panel has 10 control switches and knobs. See FIG 17. Details of the function of each are shown on pages 13,14 and 15. Additionally, there are two circuit breakers on the control panel. The 10 amp circuit breaker is to protect the grinding motor circuit and the 4 amp circuit breaker is to protect the spin drive circuit.

FIG. 17

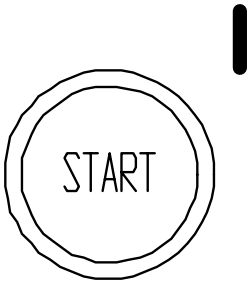
GETTING TO KNOW YOUR GRINDER (Continued)

CONTROL PANEL COMPONENT IDENTIFICATION
Review the following control panel component descriptions before proceeding with the instructions

SYSTEM START SWITCH

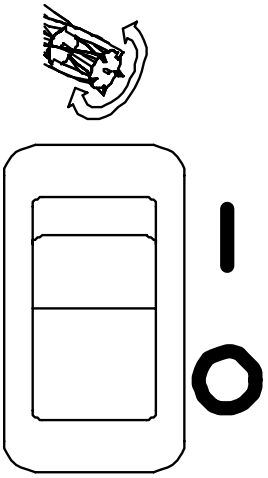
Powers all control panel systems.
Pulls in the main magnetic starter.

NOTE: The guard doors must be shut and all switches must be off for the machine to start.



SPIN DRIVE SWITCh ON/OFF

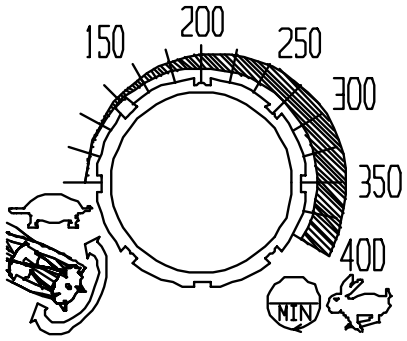
Turns the spin drive motor ON/OFF.
Guard doors must be shut for the spin drive to operate.



SPIN SPEED DIAL

RPM

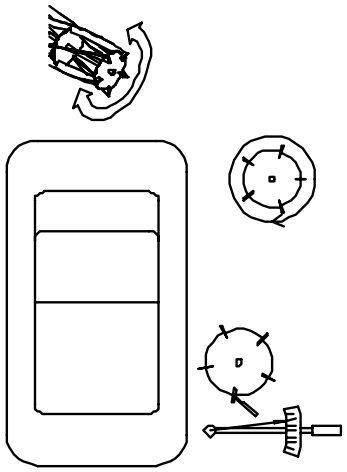
Adjusts the speed of reel rotation when you have the grind selector switch set at variable speed spin.



GRIND SELECTOR SWITCH

Variable Speed Spin
Switch must be up to perform spin grinding operations.

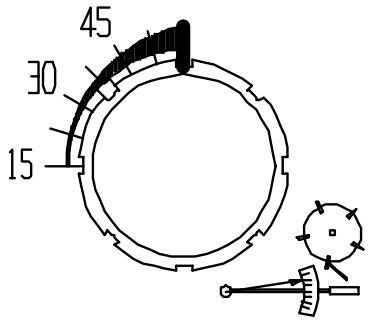
Variable Torque Relief
Switch must be down to perform relief grinding operations.



GETTING TO KNOW YOUR GRINDER (Continued)

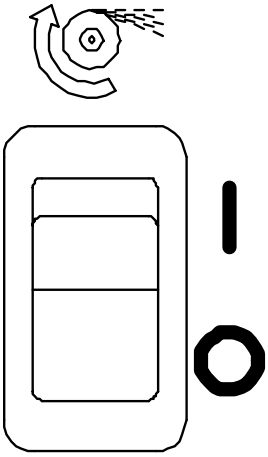
RELIEF TORQUE DIAL

Adjusts the Spin Drive Motor torque (the torque holding the reel blade to the relief finger) when Grind Selector Switch is set at variable Torque Relief.



GRINDING WHEEL MOTOR SWITCH
ON / OFF

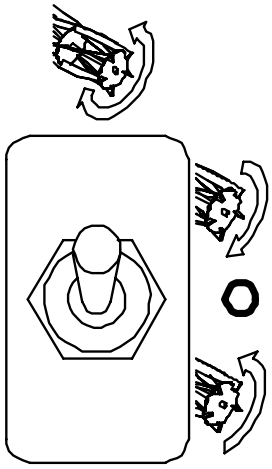
Turns the Grinding Wheel Motor on and off. Guard doors must be shut for Grinding Motor to operate.



SPIN DRIVE ROTATION SWITCH
Forward / Off / Reverse

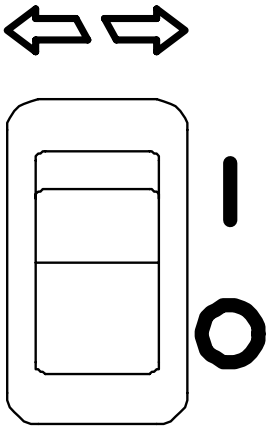
This switch reverses the spin drive motor. Toggle in middle is off position and stops rotation. NOTE : Because the spin drive motor can mount on either side of the reel rotation direction will vary.

THE MOTOR MUST COME TO A COMPLETE STOP BEFORE CHANGING DIRECTIONS. IF THE MOTOR DOES NOT COME TO A COMPLETE STOP, SERIOUS DAMAGE TO THE CONTROL MAY RESULT.



TRAVERSE MOTOR SWITCH
ON/OFF

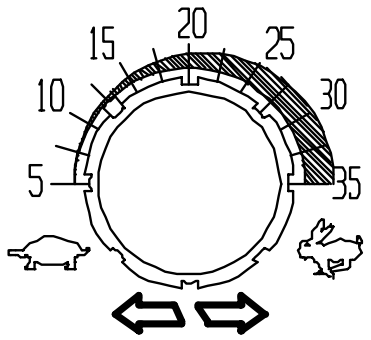
Turns the traverse drive motor on and off.



GETTING TO KNOW YOUR GRINDER (Continued)

TRAVERSE SPEED DIAL - FT / MIN

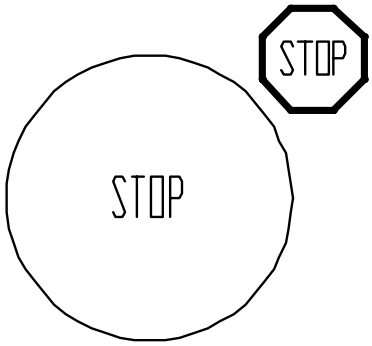
Adjusts the speed of the left & right movement of the grinding wheel carriage.



EMERGENCY STOP BUTTON

Cuts all power to the control panel functions. Stops all motors, including grinding motor, traverse motor, spin motor, etc. To restore power, pull up on the button and press the start button.

PUSHING THE EMERGENCY STOP BUTTON DOES NOT STOP ALL POWER TO THE GRINDER. POWER IS STILL DELIVERED TO THE INFEED SIDE OF THE MAGNETIC CONTACTOR. DISCONNECT THE CORD AT THE WALL OUTLET BEFORE PERFORMING SERVICE.



SAFETY INSTRUCTIONS

PLEASE TAKE SPECIAL NOTE OF THE FOLLOWING WARNING DECAL LOCATED NEAR THE WINCH OF THE MODEL 605.

--WARNING--

1. Lifting winch capacity 400 lbs. maximum.
2. Always have the lifting hooks securely attached and balanced on the cutting unit before lifting.
3. Stand well clear of the cutting unit when winching into position. Guide with extended arms only.
4. The winch is equipped with a safety ratchet. Do not defeat or override this safety feature.
5. Read warning label on winch handle and the assembly and operating manual before using the winch.

OPERATING INSTRUCTIONS

PREPARE MOWER FOR SHARPENING

Preparation of the mowing unit prior to sharpening.
It is recommended that the mowing unit to be sharpened is thoroughly cleaned. Remove wheels and bed bar, if possible from the reel. **All bedknives must be ground when reels are sharpened.** Inspect, adjust and/or replace any worn or damaged bearings. Make sure reel bearings are adjusted properly so the reel turns easily by hand.

REELS WITH EXCESS TENSION ON THE BEARINGS WILL BE EXTREMELY DIFFICULT TO SPIN GRIND AND COULD CAUSE DAMAGE TO THE REEL OR THE SPIN DRIVE MECHANISM ON YOUR GRINDER. NO MORE THAN 25 IN LBS. MAXIMUM TORQUE LOAD TO ROTATE THE REEL IS ALLOWED OR DAMAGE TO THE SPIN DRIVE COULD OCCUR.

REELS GROUND WITH BEARINGS WHICH HAVE WEAR AND/OR FREE PLAY WILL NOT HOLD DIAMETER, CYLINDRICAL SHAPE, OR STRAIGHTNESS SPECIFICATIONS.

INITIAL SET UP OF REEL SUPPORTS

A. The preferred method of mounting fairway units and greens mower units is to set the rear roller on the roller supports facing up with the offset either forward or back, depending on mowing unit requirements. Chain clamp around the roller and the tooling bar. See FIG. 18.
B. With greens mowers, you may use the centers mounting brackets. See FIG. 19.
C. On ground drive fairway mowers with exposed hubs, you should use the **OPTIONAL** Pull Gang Reel Mount Kit 18574. Normally they will be positioned in the top two holes of the lower supports with the offset "V" facing the rear of the machine. See FIG. 20.

NOTE: Because of the many different reels available the position of the "V" bracket to the lower support can be adjusted to three different height settings and two offset positions.

FIRMLY TIGHTEN ALL LOCKING KNOBS BEFORE GRINDING. ANY LOOSENESS WILL ADVERSELY AFFECT GRINDING QUALITY.

FIG. 18

FIG. 19

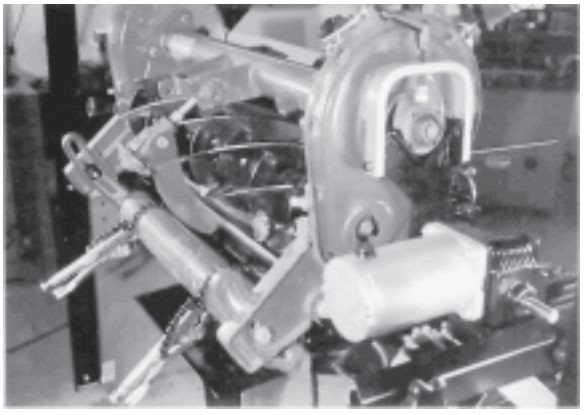


FIG. 20

INITIAL SET UP OF SUPPORTS (Continued)

INITIAL SET UP OF ROLLER SUPPORTS

The roller support brackets should be placed facing up with the V ribs 1 to 2" narrower than the width of the rear roller with the offset either forward or back, depending on mowing unit requirements.

NOTE: Tighten the side locking knob first so the bracket is forced against the mounting bar. Then tighten the bottom bracket. See FIG. 21.

FIG. 21

CENTERS BRACKET SET UP

When mounting greens mower mowing units, centers may be used to hold the mower unit. See FIG. 22. To mount, measure the outside distance of the mower frame. Using the center point of the square mounting bar position the fixed centering bracket 1/2 that distance on the left side and securely fasten. Then place the adjustable centering bracket that distance plus 1/4" on the right side of the mounting bar and loosely fasten. It may be necessary to move this bracket when lifting reel into place even though it can be adjusted. The adjusting cone should be retracted as far as possible as it will be easier to secure reels when in place.

FIG. 22

OPTIONAL PULL GANG BRACKET SET UP

On ground drive mowing units with exposed hubs you will be using the **OPTIONAL** Pull Gang Reel Mount Kit 18574, measure the distance from the outside of the hubs and subtract one inch. Determine the middle of the square mounting bar, by use of the winch cable. Then place a "V" bracket 1/2 that distance on the left side of the mounting bar and securely fasten use both locking knobs.

Now place a "V" bracket on the right side of the mounting bar the same distance from the center point, but loosely attach as it might have to be moved when reel is lifted into place. The roller support brackets should be placed 6 to 8" inside the reel supports with the "V" facing the back of the machine and securely fastened with both locking knobs. The "V's" have an offset so they can be installed high or low depending on the reel. See FIG. 23.

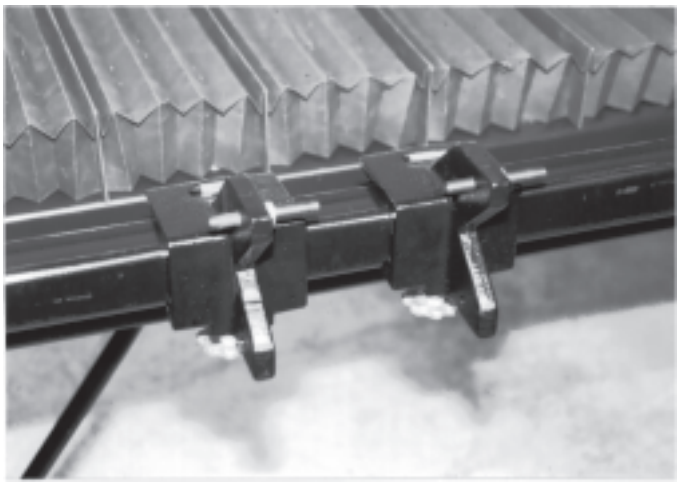


FIG. 23

FIRMLY TIGHTEN ALL LOCKING KNOBS BEFORE GRINDING. ANY LOOSENESS WILL ADVERSELY AFFECT GRINDING QUALITY.

LIFTING MOWING UNIT INTO POSITION WHEN USING ROLLER SUPPORTS

Position the mowing unit behind the grinder on the floor so the front of the mower faces towards the front of the machine. Hook the reel elevator spreader bar onto the mowing unit. The hooks on the bar should be spaced evenly along the mowing unit, so they do not slip or slide as it is being raised. See FIG. 24.

FIG. 24

THE OPERATOR SHOULD BE POSITIONED AWAY FROM THE REEL. DO NOT STAND UNDERNEATH THE REEL AS IT IS BEING RAISED. GUIDE REEL AT ARMS LENGTH.

Slowly raise the mowing unit by cranking the winch handle with the right hand and steadying the reel with the left hand. Your left arm should be extended during the lifting operation This will help keep the operator from under the mower.

NOTE: The winch has a spring loaded handle that automatically actuates a brake when the handle is released. The winch clicks as it is being raised when this brake is engaged.

Slowly move the reel into position and carefully lower the cutting unit onto the roller supports. Firmly tighten both locking knobs on the roller supports. Make certain the spin drive can be attached to a drive device on the reel.. Do not connect at this time, just make sure that the connections are close enough to attach at a later time.

When the reel roller is positioned correctly in the roller supports, wrap one of the chain vise clamps around the roller, and around the square tubing tooling bar. Firmly tighten and repeat this step with the other chain vise clamp around the other roller support.

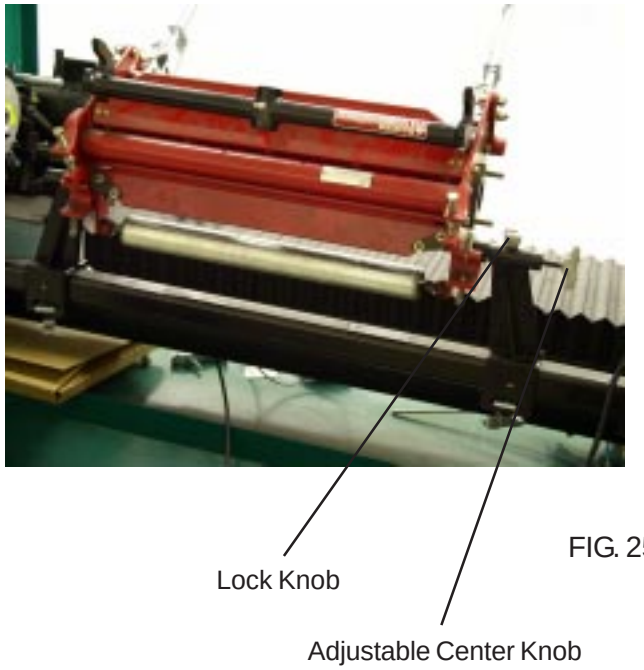


FIG. 25

LIFTING MOWING UNIT INTO POSITION WHEN USING CENTER BRACKETS

Position the mowing unit as described above using roller supports. Slowly raise the mowing unit into position and insert the fixed centering pin into a predetermined hole in the mowing unit frame. While holding the mowing unit firmly against the fixed centering pin, raise or lower the mowing unit so the adjustable centering bracket can be moved and the cone inserted in a corresponding hole in the opposite side of mowing unit frame. Now very firmly tighten both locking knobs on the adjustable bracket and then tighten the adjustable centering pin locking knob. See FIG. 25.

FIRMLY TIGHTEN ALL LOCKING KNOBS BEFORE GRINDING. ANY LOOSENESS WILL ADVERSELY AFFECT GRINDING QUALITY.

THE ADJUSTABLE CENTER MUST BE FIRMLY TIGHTENED INTO THE REEL, BUT EXCESSIVE FORCE CAN DISTORT THE REEL FRAME CAUSING BINDING AND POOR QUALITY.

Make certain the spin drive can be attached to a drive device on the reel. Do not connect at this time, just make sure that the connections are close enough to attach at a later time.

LIFTING MOWING UNIT INTO POSITION WHEN USING THE OPTIONAL PULL GANG MOUNTING BRACKETS

Position the mowing unit as described on the previous page using roller supports. See FIG. 26

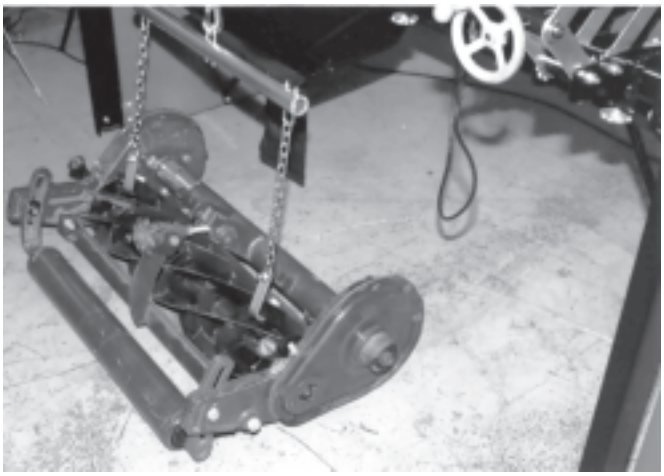


FIG. 26

Slowly raise the mowing unit, when the hub of the reel has been raised above the top of the "V" bracket slowly position the left side of the reel into the bracket and lower until you make contact with the bracket.

Now reposition the right "V" bracket if necessary and lower the reel completely into both brackets. Securely tighten the right bracket using both locking knobs.

NOTE: On reels that have a square or hexagon shaped hub make sure that the surface of the hub is against the flat machined surface of the "V" bracket.

When the reel is correctly positioned in the V-bracket, swing the clamping handles into place and firmly lock in place. See FIG. 27.

NOTE: The clamping handles have two mounting positions for large and small hubs.

NOTE: Unless the elevator hooks interfere with the reels ability to spin, leave the elevator hooks and spreader connected to the reel with slight tension on the wire cable.

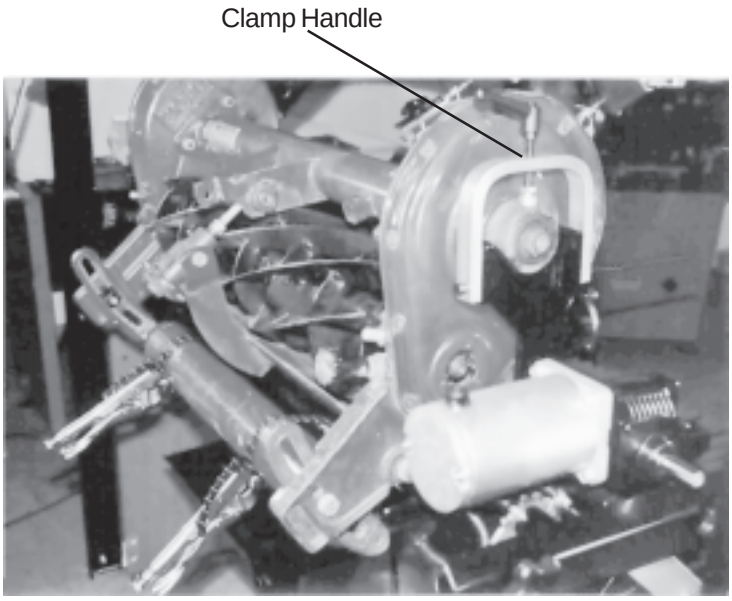


FIG. 27

LIFTING MOWING UNIT INTO POSITION WHEN USING THE OPTIONAL PULL GANG MOUNTING BRACKETS (CONTINUED)

There are two (2) roller supports that are mounted to the square mounting bar so that the "V" faces the back of the machine as pictured in FIG. 28A.

There are four (4) **OPTIONAL** long set screws on these brackets which are used to hold the **OPTIONAL** extender plates when it is necessary to move mower roller back further to help expose the drive nut in the reel. These set screws will also be used to attach the chain vise clamps when reels are in position.

Position the roller supports so the reel roller is centered on the two (2) supports and firmly lock in place.

NOTE: On some reels the "V" grooves of the roller supports will be positioned on top of the support bar. This application is used primarily for fairway and greens mowers. See FIG. 28B.

If extender plates are necessary to move mowing unit back further, simply pull the mowing unit back out of the way and slide extender plate onto both long socket head set screws and tighten down with 3/8-16 nuts and 3/8 lockwashers. See FIG. 28C.

MAKE SURE THAT THE ELEVATOR CABLE IS ATTACHED TO THE REEL AND THAT SOME TENSION IS ON CABLE BEFORE PULLING REEL BACK.

When the reel roller is positioned correctly in the roller brace, wrap one of the chain vise clamps around the roller, and around the stud on the roller brace. Firmly tighten and repeat this step with the other chain vise clamp around the other roller brace. See FIG. 29.

FIRMLY TIGHTEN ALL LOCKING KNOBS BEFORE GRINDING. ANY LOOSENESS WILL ADVERSELY AFFECT GRINDING QUALITY.

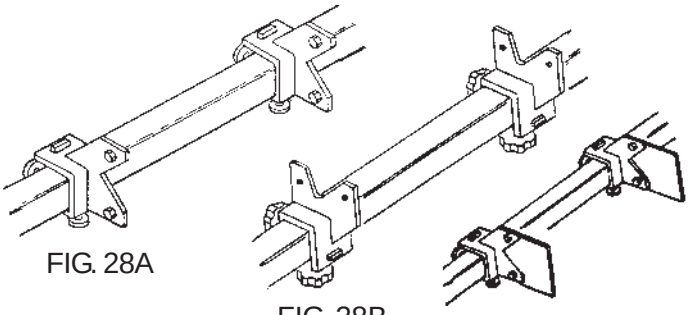


FIG. 28A FIG. 28B FIG. 28C

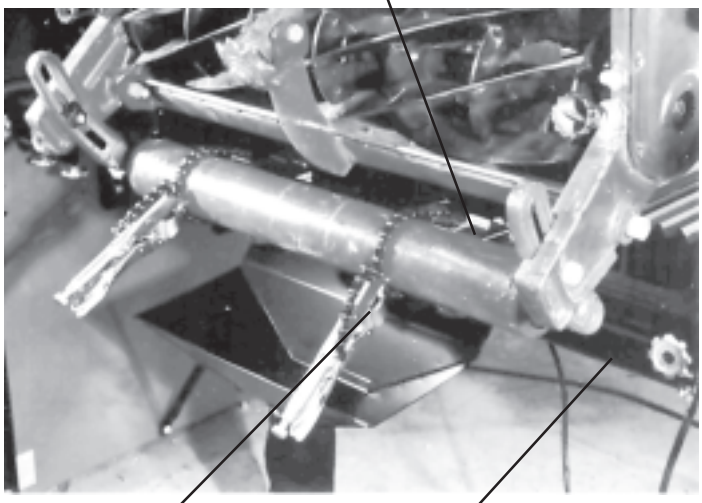


FIG. 29

ATTACHING THE OVERHEAD CLAMPING ARMS

Your grinder is supplied with two lengths of clamp rods and two sizes of clamping lips, determine which size of clamp rod is appropriate for the mowing unit you are grinding. Normally the shorter rod is used.

NOTE: Using the long clamp rods on large reels may cause an interference between the rods and the front guard doors.

Determine which clamp lips to use in your grinding application. You have three choices; First, the large lip clamps which are primarily attached to the front rollers. Second, the small lip clamps are primarily attached to a mowing unit cross bar or a mounting lug or bolt. Third, you can remove the clamping lips, turn the clamp rods 90 degrees and attach the clamp rods directly to the mowing unit using the hole on the end of the clamp rod attached to a stud or bolt on the mowing unit frame.

Loosen the two (2) screw handles on each overhead clamp and move them to where the overhead clamp rods with or without clamping lips can be attached to the mowing unit. Tighten the clamping lips to the mower, then securely tighten the two (2) locking handles on each overhead clamp. See FIG. 30 and FIG. 31.

The overhead clamps can be mounted with the clamping rod above the tubing cross bar as shown in FIG. 31 or they can be mounted with the clamp rod under the tubing cross bar as shown in FIG. 32. It is recommended to mount them under the tubing cross bar whenever possible.

Before tightening the overhead clamps you must correctly position the mowing unit. When using the roller supports or the centers, you can pivot the cutting unit with the overhead clamps. With the relief grinding wheel and the relief guard with fingers installed, you must pivot the cutting unit so you have clearance of the relief finger to the frame, clearance of the next blade to be relieved to the grinding wheel and clearance of the grinding wheel to the front roller.

DO NOT TIGHTEN THE LEFT HAND SLIDE ROD CLAMP WHERE RODS ARE INSERTED INTO THE LOWER PART OF THE CLAMP UNTIL REEL HAS BEEN ALIGNED.

FIRMLY TIGHTEN ALL LOCKING KNOBS BEFORE GRINDING. ANY LOOSENESS WILL ADVERSELY AFFECT GRINDING QUALITY.

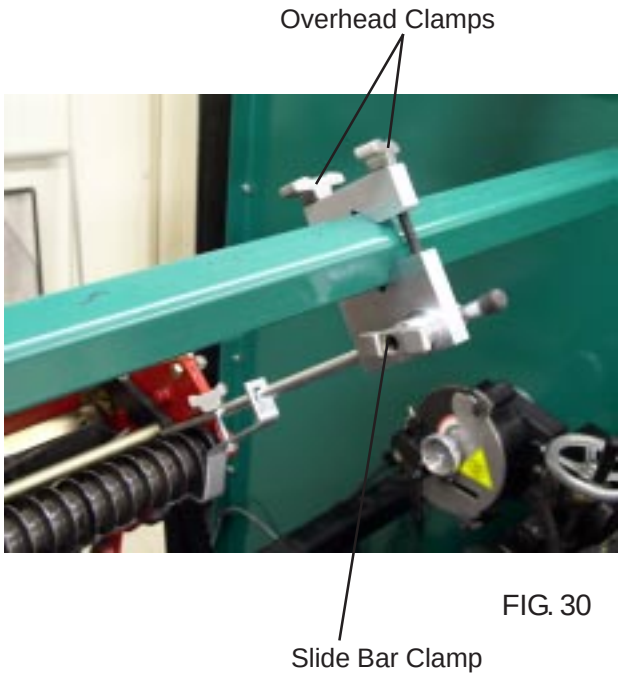


FIG. 30

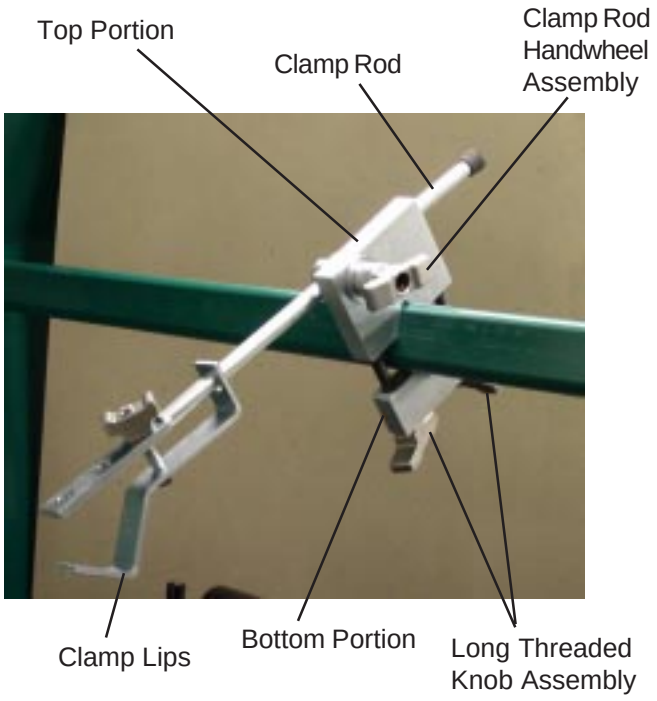


FIG. 31

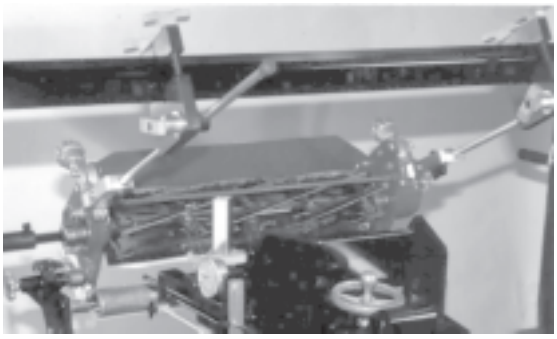


FIG. 32

ATTACHING THE VARIABLE SPEED SPIN DRIVE UNIT TO THE REEL

When spin grinding, the reel should turn in the same direction as the grinding wheel. See FIG. 33. The normal position for the spin drive unit is on the right side of the square mounting bar when viewing from the mowing unit loading position of the machine.

Before positioning the spin drive unit, familiarize yourself with the available adjustments and coupler/ drive assemblies.

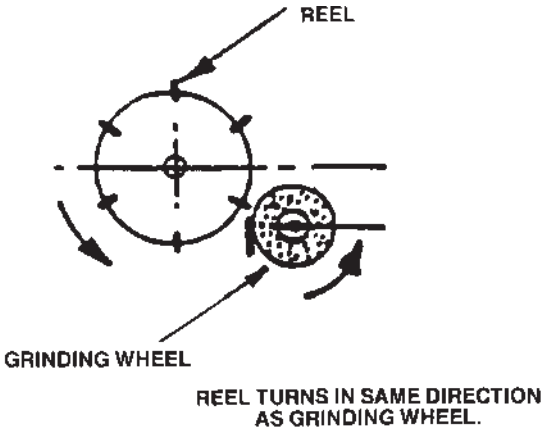


FIG. 33

KNOB A--
Adjusts the scissor bar to move the unit up and down.
KNOB B (2 EACH)--
Allows the spin unit to be loosened and moved in and out.
KNOB C & D--
Allow the spin assembly to be loosened from the support bar frame and moved side to side.

When positioning the spin unit it will be necessary to complete several of the above adjustments to properly align the spin unit to the reel.

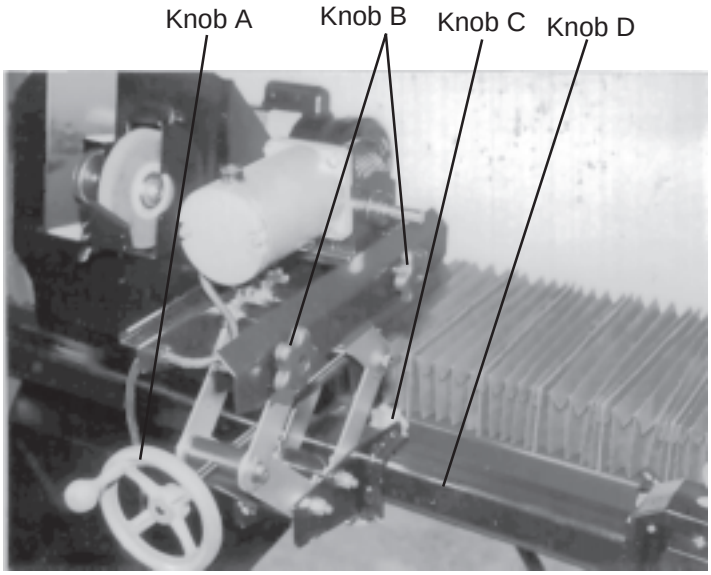


FIG. 34

34a. Rubber Sleeve Coupler: This is placed in the corresponding flange coupler already mounted in the spin drive shaft.
34b. Drive Coupler Assembly: This is mounted to the rubber coupler.
34c. Adapter Sleeve: Connects the rubber coupler to the square drive adapter.
34d. Square Drive Adapter: This is inserted into the drive coupler adapter and should be able to be moved approximately 2". It will be necessary to move this when attaching reel to spin drive unit. It is then inserted into any 1/2" square drive socket. This square shaft has a groove machined into it on the opposite end of the snap ring. This groove is there to advise that you have reached the maximum extension of the square drive shaft. If you cannot connect to the reel without extending past this groove, then the spin unit must be repositioned on the tooling bar (knobs C & D above).

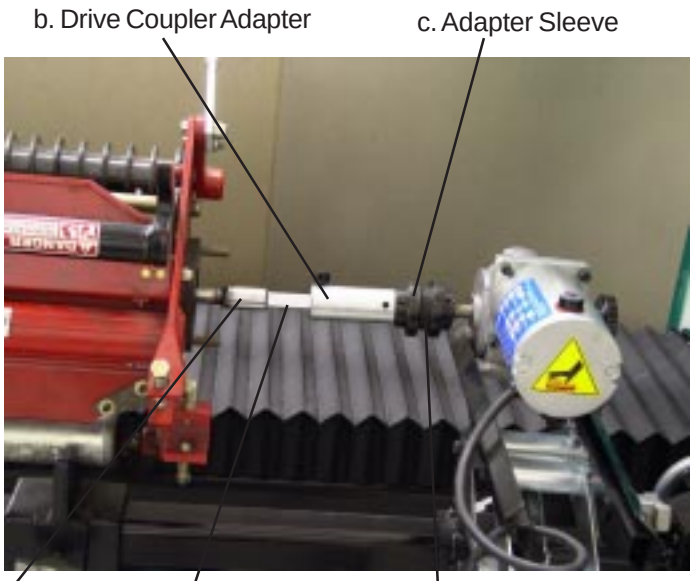


FIG. 35

DO NOT EXTEND SQUARE SHAFT PAST GROOVE, INSTEAD REPOSITION SPIN UNIT.

OPERATING INSTRUCTIONS (Continued)

NOTE: The 1/2" square drive socket that is places on the reel when spin grinding is NOT included with the grinder. You must purchase this from an appropriate local supplier of tools. Many of today's reels have a spline at the end of the reel shaft to receive the hydraulic motor shaft. The cutting unit manufacturer has adapters you can purchase to drive these reels.

The following procedures will make setting up the spin drive unit easier.

1. Move spin drive unit close to the reel. Align the shaft on the spin drive with the drive component on reel by completing the necessary adjustments discussed on the previous page.
2. Now slide the spin drive unit approximately 7" from the reel drive coupling point and securely fasten to the square mounting bar tightening both locking knobs.
3. Place the proper 1/2" square drive socket or adapter on the reel drive component and then insert the square drive shaft into the socket. Place the adapter sleeve over the drive shaft and insert the drive coupler adapter assembly into it. Finally place the rubber coupler onto the drive coupler adapter. See FIG. 36.
4. By holding the square drive shaft firmly into position with your left hand you will be able to move the other components to the right and insert the rubber coupler into the flange on the spin drive unit. When this is done tighten the Tee Knob on the adapter sleeve to hold all parts in place. See FIG. 37.
5. Finally readjust the spin drive unit if it is not in alignment.

NOTE: It is not necessary to have perfect alignment but it must be close enough so that the coupler remains engaged and that excess torque is not applied to the reel.

When intalling large reels into the grinder there may not be room to install the full spin drive adapter assembly. The Spin Drive Adapter Assembly has been designed so that you can remove the 6009051 Square Drive Adapter and the 6009052 Adapter by loosening the two 1/4-20 x 3/8 Socket Setscrews. This will expose the square end of 6009217 Drive Coupler Adapter. This can then be short coupled to the reel. See FIG. 38.

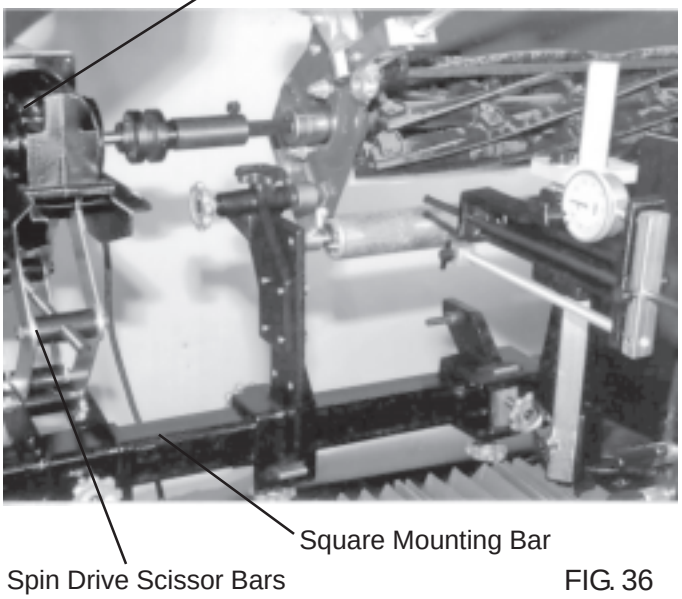


FIG. 36

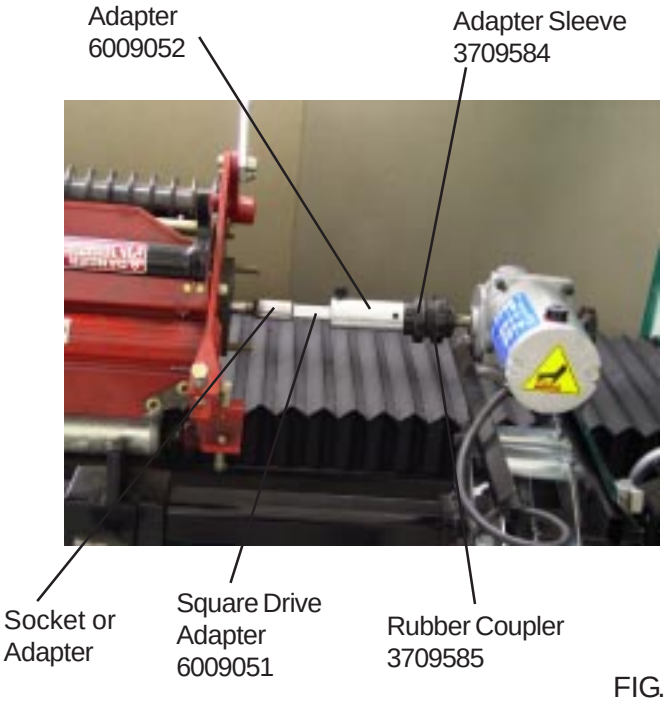


FIG. 37

FIG. 38

In most cases, it is recommended to leave the spreader bar and chains hooked up to the mowing unit as an added safety precaution. The cable should be winch tight to insure the chain, hook and spreader bar will not become engaged with the reel during sharpening.

REMOVING SPREADER BAR FROM REEL

If the hooks will not clear the spinning reel, then remove the spreader bar and hooks from the mowing unit. Place hooks over the top channel on the boom and crank up excessive slack.
See FIG. 39.

FIG. 39

DIAL INDICATOR SET UP FIXTURE

The dial indicator set up fixture is designed to be quickly mounted into position and/or quickly removed.

The fixture is mounted to the front left corner of the grinding head assembly as shown in FIG. 40.

When the fixture is not in use, it is quickly removed and can be stored on the tool tray.

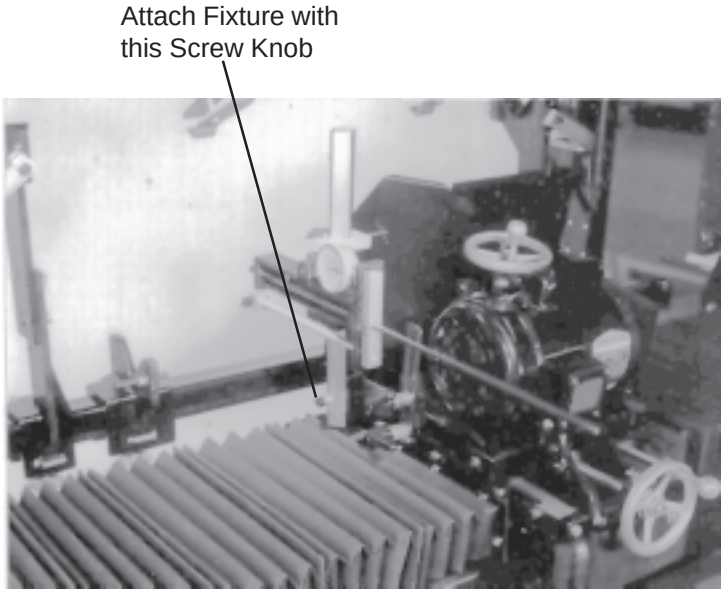


FIG. 40

REEL ALIGNMENT USING THE DIAL INDICATOR SET UP GAGE ASSEMBLY

A. Mount the set up gage into position on the left front side of the grinding head assembly. The gage assembly can be set on the roll pin on the grinding head slide base. This will line up the tee knob with the threaded hole in the casting for an easy install. See FIG. 40.

B. The left side over head clamp rod adjusting knob (See FIG. 41.) must be loose to allow the mower assembly which is mounted on the mower support bar to move freely when doing horizontal and vertical adjustments.

The overhead clamp rods will generally be used as described below:

1. If the mowing unit is mounted with the ground roller clamped to the roller supports with the chain vice clamps, because the geometry does not offer enough stability or rigidity, the overhead clamp rod on the fixed end (right side in the operator's position) should be kept tight.
2. If the mowing unit is mounted in centers and only being stabilized by the overhead clamp rods, then the clamp rod on the fixed end must be kept tight.
3. If the mowing unit is clamped in the **OPTIONAL** Pull Gang Reel Mount Kit 18574 V-brackets and the ground roller is clamped with chain vice clamps, then both overhead clamp rod adjusting knobs can be loose.

C. Loosen the two locking knobs on the cross slide assembly on the left side of the square mounting bar so that it can be adjusted in both the vertical and horizontal plane. See FIG. 42.

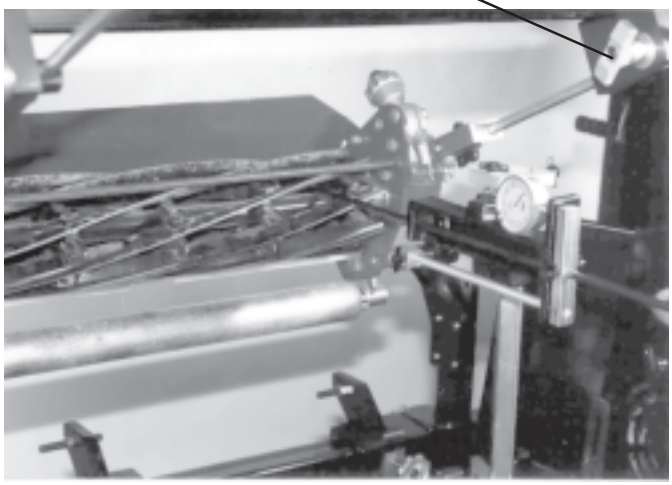


FIG. 41

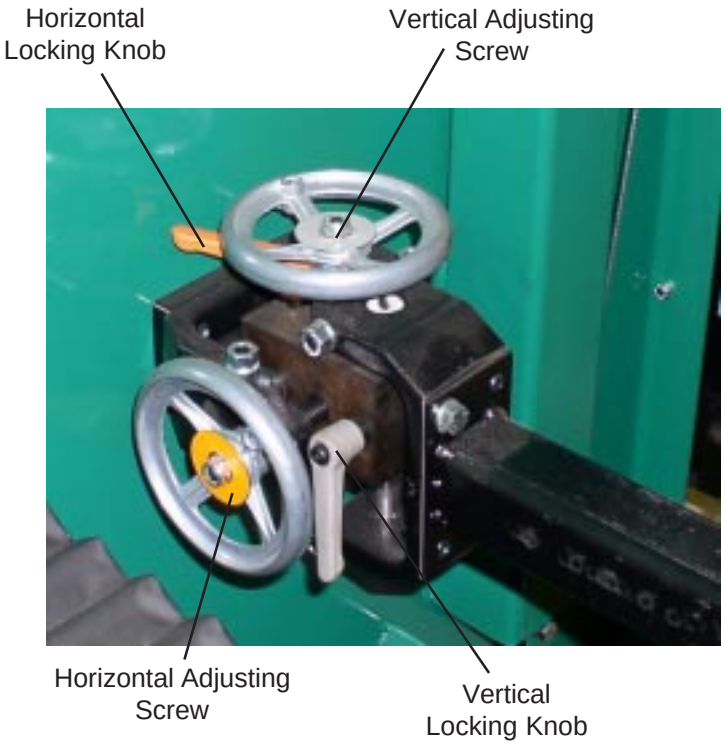


FIG. 42

OPERATING INSTRUCTIONS (Continued)

ALIGNING REELS IN THE VERTICAL PARALLELISM PLANE

A. Move the grinding head assembly until the set up fixture is approximately 1" from the right side of the reel. Lock the Knob A within approximately 1/8" .125" (3MM) of center shaft of the reel. See FIG. 45.
B. Raise the indicator slide casting on the vertical support so that the indicator rod can be extended over the center shaft of the reel. See FIG.43 and 44.
C. Lower the indicator slide by turning the vertical fine adjustment Knob B until the alignment rod lightly touches the top of the reel center shaft. See FIG. 47.
D. Pull rod back and lock Knob C. See FIG. 45. Traverse to the other side of reel, same distance from end. Loosen Knob C and extend alignment rod. See FIG. 46.
E. If the left side is lower than the right, turn the vertical adjusting grey handwheel in the cross slide assembly clockwise raising the mounting bar and the reel until the center shaft of the reel lightly touches the extended indicator rod. See FIG. 35.

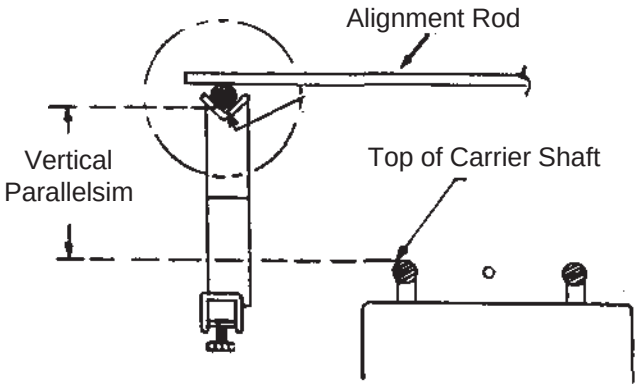


FIG. 43

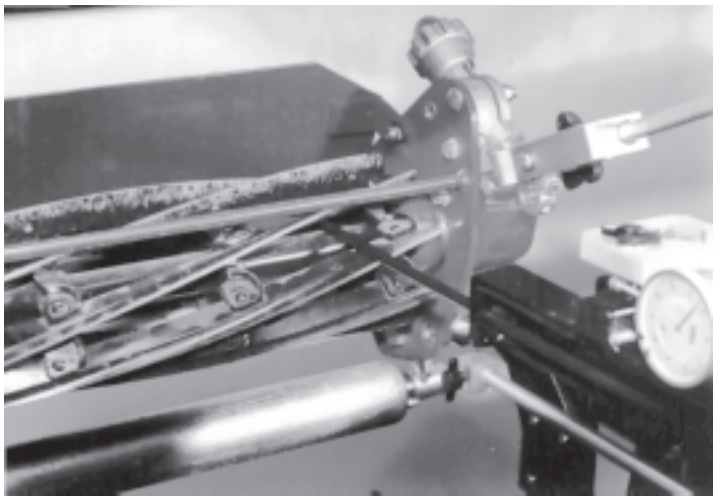


FIG. 44

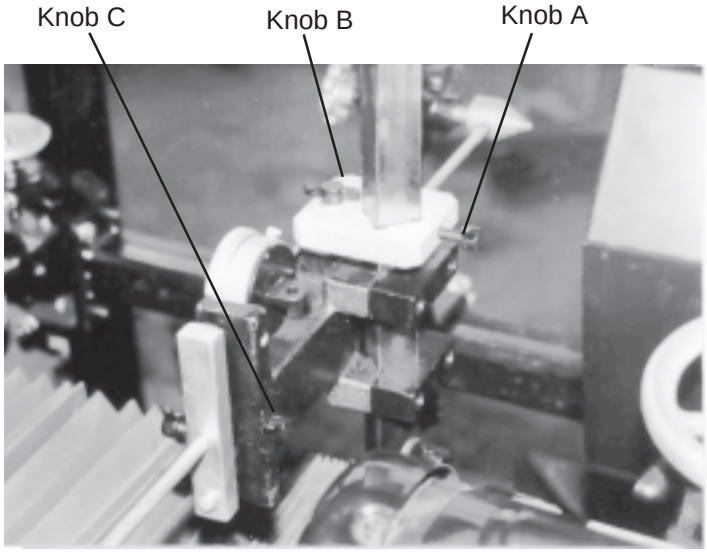


FIG. 45

FIG. 46

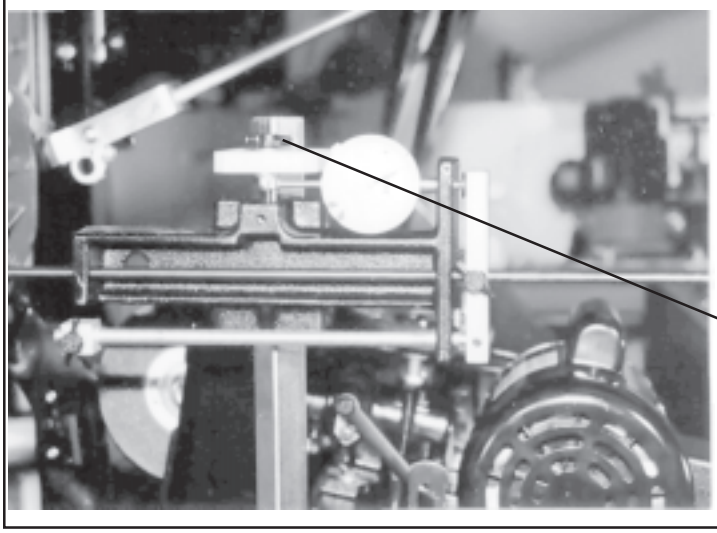


FIG. 47

VERTICAL ALIGNMENT (Continued)

F. Take note of the grey knob so you know from where you are starting. See FIG. 49. Now turn the vertical adjusting grey handwheel an additional 1/2 revolution. This 1/2 revolution is to compensate for the fact that as you adjust the left side, the right side is also moving at a proportioned amount. This should almost align your reel in the vertical parallelism plane. See FIG. 49.

G. Move the alignment fixture back to the right hand side of the reel and readjust the alignment rod so that it lightly touches the top of reel center shaft.

H. Move is back to the left side to make sure the reel is in correct vertical position. If not, move vertical adjustment grey handwheel up or down so that it just touches alignment rod on both sides. When it does, retest right and left sides until the same.

I. If the left side of the reel is found to be higher than the right, lower the mounting bar and reel until alignment rod lightly touches the top of the reel center shaft and then turn the vertical adjusting grey handwheel an additional 1/2 revolution. This 1/2 revolution is to compensate for the fact that as you adjust the left side, the right side is also moving at a proportioned amount. This should line the reel up accurately on both sides. Then continue with procedures found in "G" and "H" above.

J. Now lock the grey vertical adjusting screw locking knob. See FIG. 49.

NOTE: This alignment is not as critical as the horizontal plane, but care should be taken on all reel set ups. The accuracy to be within approximately .010".

NOTE: The pivot end of the support bar is pinned to the frame permanently. The adjustable end can be adjusted independently both vertically and horizontally.

CAREFULLY REVIEW THE CORRECT IDENTIFICATION OF THE COLORED LOCKING KNOBS IN FIG. 49 MAKE CERTAIN YOU ARE LOCKING AND UNLOCKING THE CORRECT KNOBS.

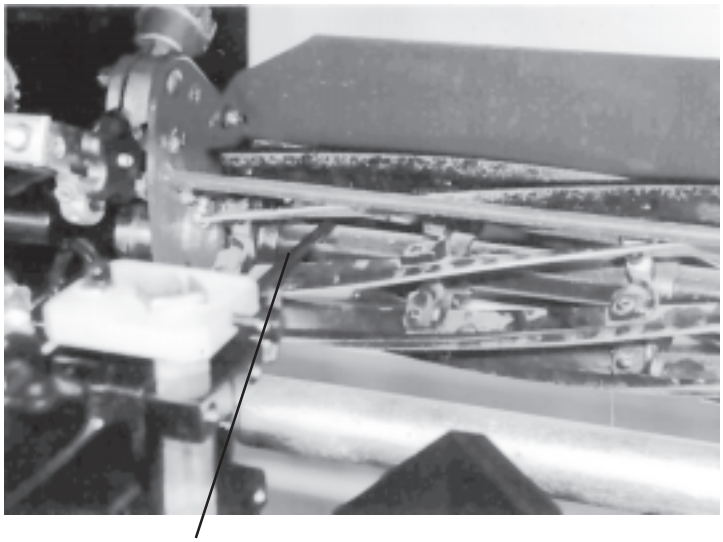


FIG. 48

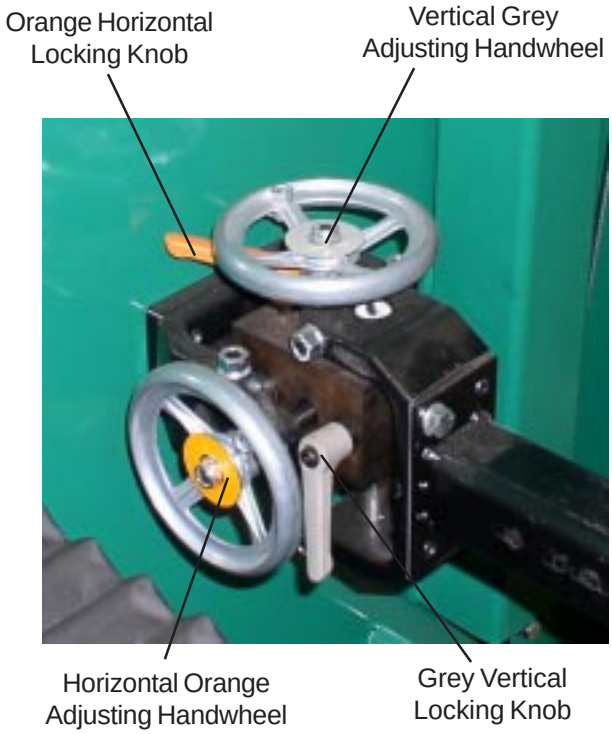

Orange Horizontal Locking Knob
Vertical Grey Adjusting Handwheel
Horizontal Orange Adjusting Handwheel
Grey Vertical Locking Knob

FIG. 49

OPERATING INSTRUCTIONS (Continued)

ALIGNING REELS IN THE HORIZONTAL PARALLELISM

THIS IS A CRITICAL SET UP AND CARE SHOULD BE TAKEN WHEN MAKING THESE ADJUSTMENTS. IF REEL IS OUT OF POSITION IN THE HORIZONTAL PLANE, IT WILL BE GROUND CONE SHAPED. SEE FIG. 56.

A. Move set up gauge on the right hand side of reel approximately 1" from the end. See FIG. 51.
B. Lower the indicator slide casting on the vertical support so the indicator rod can make contact with the center of the reel shaft within approximately 1/16" .062" (1.5 MM) and lock Knob A. See FIG. 45. Center shaft should be clean and free of rust where rod makes contact. Now fine adjust using Knob B until at the center of the center shaft of the reel. See FIG. 47.
C. Now loosen Knob D on the indicator stop bar. Holding the indicator rod firmly against the reel shaft, move the indicator stop bar back, until no contact is made with the indicator rod plunger. Now move indicator stop bar forward until contact is made and then an additional 1/2". This will set the plunger at about its midpoint and allowing it to move in both directions. See FIG. 53.
D. Now set the outer dial indicator to the "0" position. Read and note the position of the smaller (.100) dial. You must know this reading when setting up the other side. Pull back and lock with Knob C. See FIG. 45.
E. Move the alignment gauge to the left side of the reel carefully retracting the indicator rod so as not to damage or change setting. Set indicator rod on the same position on the reel as on the other side, that is 1" from the end and centered on the shaft. See FIG. 50. Now read the dial indicator to determine the distance the reel is out of position.

NOTE: Because the set up gauge is mounted to the carriage, you can unlock the actuator drive system and traverse manually from end to end.

When you pull the indictor rod back, there is a wing screw ("C") to snug up so you do not have to hold the rod in the back position.

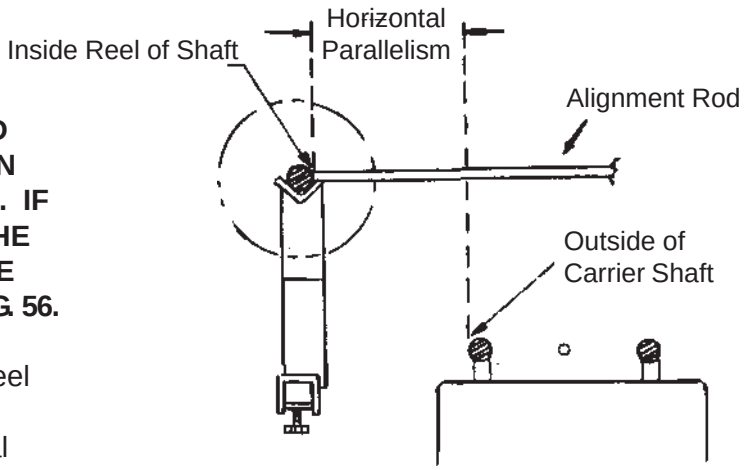


FIG. 50

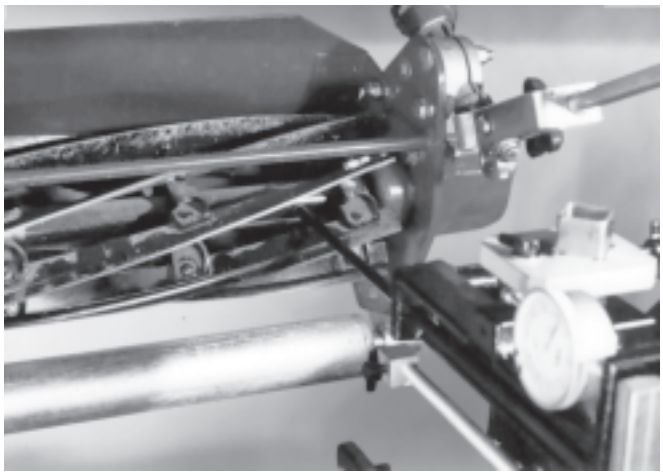


FIG. 51

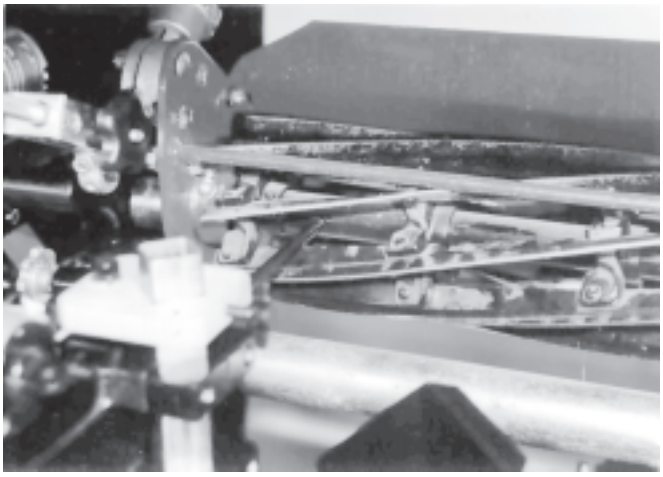


FIG. 52

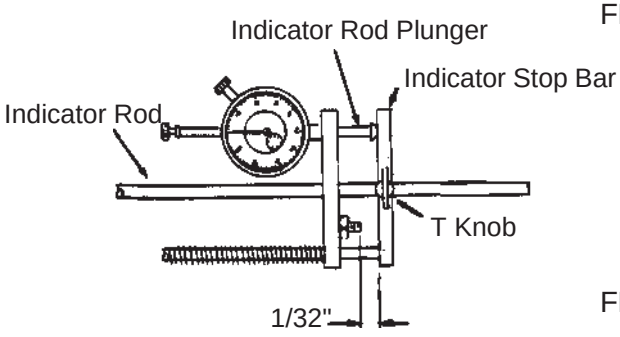


FIG. 53

ALIGNING REELS IN THE HORIZONTAL PARALLELISM (Continued)

F. To adjust reel position first determine the direction the reel has to move for alignment. The direction that the reel will have to be moved can be determined by pulling back on the dial indicator stop bar and if the dial moves back to the "0" position you will have to move the reel towards you. If that cannot be done the reel will have to be moved away from you.

There are two adjusting steps for final positioning of the reel as follows:

1. With the reel set gauge still in the left hand side of the reel, turn the orange horizontal adjusting handwheel (FIG. 49) in the direction required to match the initial indicator reading on the right hand reel position. See FIG. 51.
2. Now travel farther by half the amount already traveled.

The reason for this is that the square mounting bar pivots on one end and is adjusted on the opposite end. Anytime the adjusting end is moved to change the left side dimension, the right side dimension is also changing at a ratio to the left side. By over compensating at the adjusting end you will compensate for this movement and get the reel aligned much faster.

ALIGNING REELS IN THE HORIZONTAL PARALLELISM (Continued)

G. Now move the set up stand back to the right side of the reel. Set indicator rod on the same spot you used the first time and reset large dial on "0". Make sure you read the setting on the small scale and note. Then proceed with paragraph "E" & "F" again. This should give final adjustment. When you have done this procedure a few times you will find this procedure will become very easy.

IT IS ESSENTIAL THAT CARE IS TAKEN WHEN SETTING THE REEL UP IN THE HORIZONTAL POSITIONS IN ORDER TO GRIND IT INTO A CYLINDER SHAPE. ANY MISALIGNMENT WILL CAUSE YOU TO GRIND INTO A CONE. SEE FIG. 56.

H. When the horizontal parallelism has been adjusted to within .003" (.076 MM) end to end, tighten the orange horizontal adjustment locking knob See FIG. 54 and both overhead clamp adjusting knobs. See FIG. 55. When tightening the knob it is very important that you have the dial indicator located at that side of the reel and watch it as you tighten. It must not move in the tightening process. After both knobs are tight, recheck alignment.

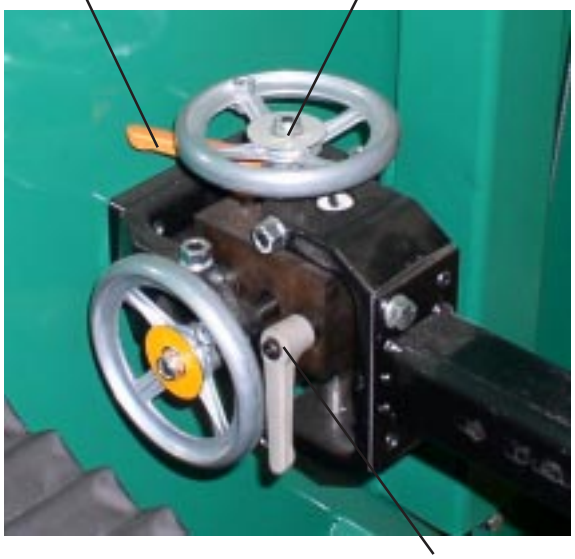

Orange Horizontal Locking Knob
Vertical Grey Adjusting Handwheel
Horizontal Orange Adjusting Handwheel
Grey Vertical Locking Knob

FIG. 54

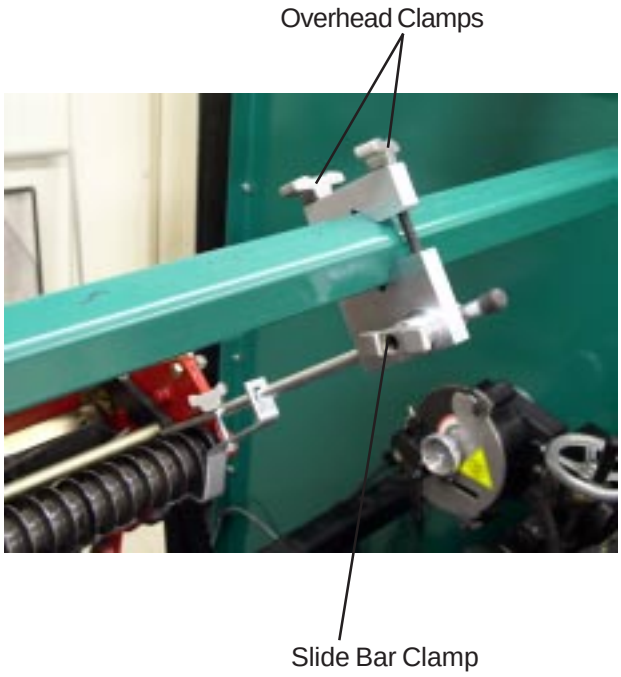


FIG. 55

CHECKING REEL FOR CONE SHAPE, REEL ROUNDNESS, AND STRAIGHTNESS OF REEL OUTSIDE DIAMETER.

BEFORE GRINDING--

A. Before storing the set up gauge, it is very effective to use it to check the ungrounded reel to determine the amount the reel is conical in shape and which end has the larger diameter. See FIG. 56. Start with the set up gauge at the right end of the reel. Loosen the wing nut on the indicator stop bar, holding the indicator rod firmly against one blade. See FIG. 53. Pull the indicator stop bar back until it clears the plunger then advance it forward until it contacts the plunger and advances it 1/2 inch further. Lock in place. This sets the plunger at its midpoint and allows adequate movement in both directions. Set outer dial at zero and note position of pointer on small dial.

B. Now move it to the left side of reel and indicate the same blade. From the reading determine the amount the reel is cone shaped. This also determines high point for grinding. Grinding of a reel must always start at the high point.

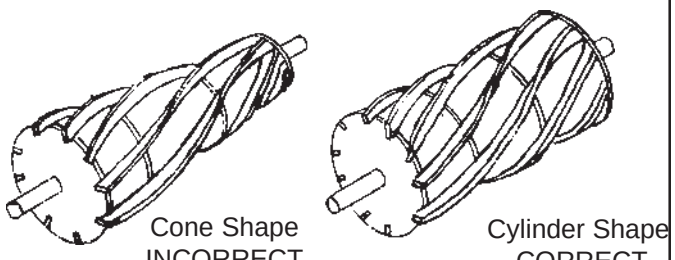


FIG. 56

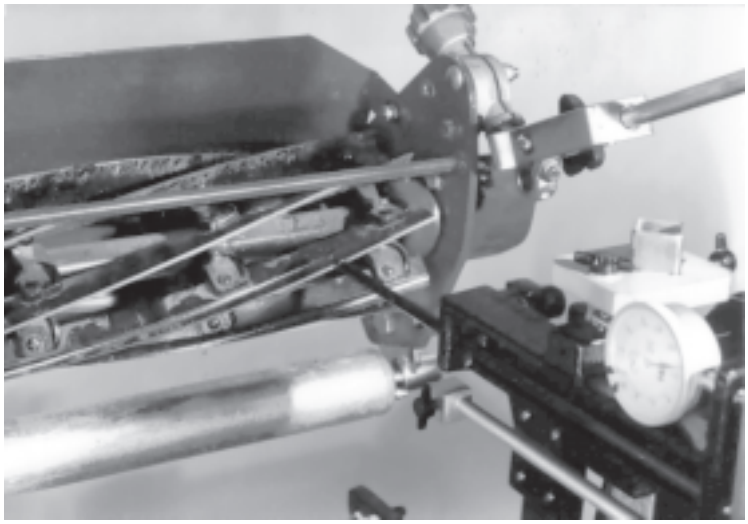


FIG. 57

AFTER GRINDING--

A. After grinding a reel, check the roundness on each end of the reel and center before removing ground reel. See FIG. 57. Loosen the wing nut on the indicator rod firmly against one blade. Pull the indicator stop bar back until there is a 1/32" gap between it and the set screw. This is to permit rotation of the reel blades to ride on the domed anvil only. See FIG. 58. At each location (left, right and center) turn the reel by hand and observe the indicator variations. All readings should be within .002".

B. Straightness of reel outside diameter--Take indicator readings at both ends of reel. Compare readings between each end of reel for straightness. All reading should be within .002".

C. Carefully remove the setup gage and store it on tool tray.

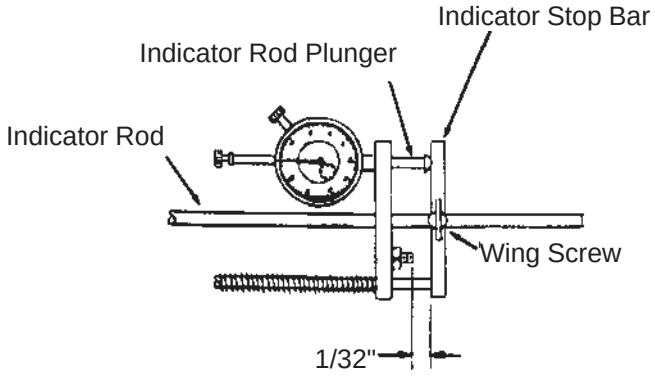


FIG. 58

SETUP PROCEDURE FOR SPIN DRIVE RPM VERSUS TRANSVERSE SPEED

SPIN DRIVE RPM

SPIN DRIVE RPM IS VERY IMPORTANT IN ACHIEVING A QUALITY GRIND. USE CARE IN ESTABLISHING THE SPIN DRIVE RPM, PER THE INSTRUCTIONS BELOW.

Generally, the Spin Drive RPM will be between 180 RPM (45%) and 300 RPM (80%). The speed required to spin a specific reel is dependant on reel diameter, the number of reel blades, and reel hardness. For all reels, there is an optimum Spin Speed where there is an **AGGRESSIVE**, yet smooth grind as you spin grind the reel. Your objective is to spin grind the reel as aggressively and as fast as possible while maintaining top quality.

It is recommended to start grinding each reel at a Spin Speed of 200 RPM (50%) and evaluate the RPM by adjusting higher and lower to optimize the Spin Speed for that reel. If the Spin Speed is incorrectly set, you can experience two problems, grinding wheel dressing or grinding wheel resonance. Each of these problems is explained below.

On some reels, especially small diameter high blade count reels if the Spin Speed RPM is set to high, the reel can act as a dresser to the grinding wheel. There can develop what appears to be a very aggressive grind (as if the infeed has self infed) and then a sudden stop of grinding with no grinding wheel to reel contact. If this occurs, your Spin Speed was set to high and you effectively dressed your grinding wheel.

Some reels have a resonant RPM where the reel goes into harmonics with the grinding wheel and the resonance vibrates the grinder and results in a very bad grind. By changing the Spin Speed to a higher or lower RPM you will move out of the resonant range.

After determining the best Spin Speed RPM for a reel, note the RPM on a "Setup Chart" that you will make. By noting the correct RPM, you will avoid evaluating the Spin Speed the next time you grind the reel.

TRAVERSE DRIVE RPM

The Traverse Speed potentiometer is adjustable from approximately 5 feet per minute [1.5 meters per minute] to 35 feet per minute [10 meters per minute]. It is recommended to grind between 15 and 20 feet per minute [4 and 6 meters per minute].

Grinding at a slower traverse speed, 10 feet per minute [3 meters per minute] as an example, will give a better finish but will extend the grind cycle time. Grind finish versus grind cycle time is controlled by the choice of the operator.

GRINDING REEL INTO A TRUE CYLINDER BY SPIN GRINDING

This ACCU-Sharp model 605 grinder is equiped with two grinding wheels and two grinding wheel guards. Prior to spin grinding install or verify installation of the 1" (25 MM) wide grinding wheel and the spin wheel guard which has no fingers attached. See FIG. 59

A. Before you proceed any further, check all knobs to insure they are tight.

FIRMLY TIGHTEN ALL LOCKING KNOBS BEFORE GRINDING. ANY LOOSENESS WILL ADVERSELY AFFECT GRIND QUALITY.

B. There are three (3) lock handles for locking the grinding wheel vertically. Two (2) on the base for the adjusting arm locks and one for grinding wheel vertical height adjustment locking screw. See FIG. 60.

C. Position the height of the grinding wheel center so that it is 0 to 1" below the reel center. See FIG. 61.

D. Infeed the grinding wheel until it just makes contact with a reel blade while rotating the reel by hand. Now tighten the two locking knobs on the locking arms and the locking knob for the height adjustment screw. Back the grinding wheel off so it just clears the reel.

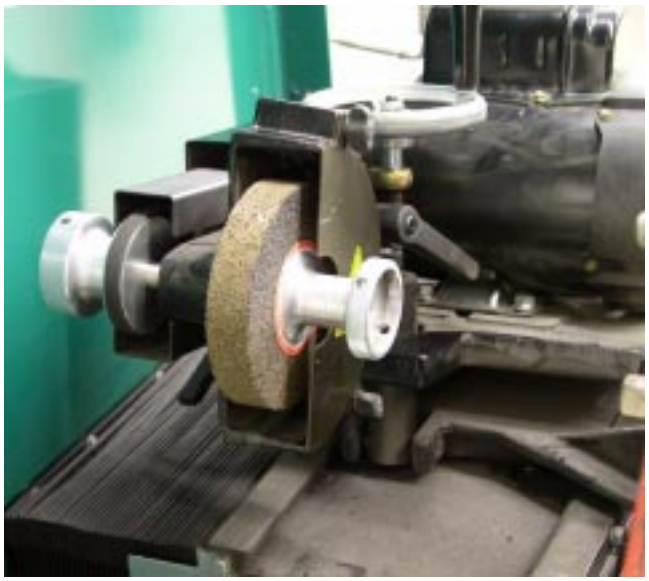
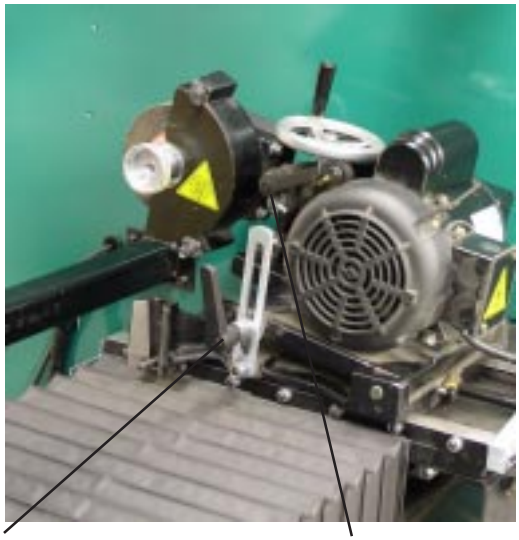


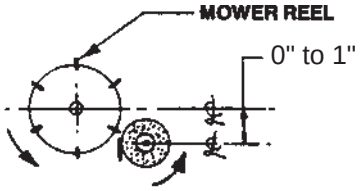
FIG. 59



Lock Handle Adjusting Arms (1) each side

Lock Handle Vertical Adjustment Lock

FIG. 60



THE REEL AND GRINDING WHEEL ARE TO ROTATE IN THE SAME DIRECTION.

FIG. 61

GRINDING REEL INTO A TRUE CYLINDER BY SPIN GRINDING (Continued)

E. Move the grinding wheel back from the reel and frame so it will clear at all points. Set proximity stops so they line up approximately with the end of the frame and tighten them securely. Adjust the traverse speed knob to zero and turn traverse switch to on. Increases the traverse speed knob so the carriage will traverse slowly across the reel. See FIG. 62 & 63.

When the carriage has come to a momentary stop against proximity switch, turn traverse switch off. In this position, check to see that grinding wheel has cleared the end of the reel. If not, readjust stop so that this happens.

CAUTION, IF THE REEL FRAME EXTENDS PAST THE REEL ITSELF, MAKE SURE THE STOP IS SET SO THAT THE GRINDING WHEEL WILL NOT RUN INTO FRAME WHEN GRINDING. IT IS POSSIBLE THAT IN SOME CASES THIS WILL MEAN THE GRINDING WHEEL WILL NOT CLEAR THE END OF THE REEL WHEN GRINDING.

F. Repeat this procedure for the other side of the reel. Then set the traverse speed dial to "10" and let the carriage traverse back and forth to make sure that the stops are set properly.

G. Move grinding carriage to the high side end of the reel and stop carriage.

Put the Grind Selector Switch to Variable Speed Spin.

CLOSE THE FRONT AND REAR DOORS.

H. Turn on spin drive motor and check to see if reel is spinning freely and that coupling components are properly aligned.

I. With the spin drive running at 200 RPM, turn on grinding wheel motor on main control panel. Verify that the spin rotation is the same as the grinding wheel, clockwise, looking at the right end of the reel from the operators position. Now slowly infeed the grinding wheel until it just make contact with the reel. See FIG. 64.

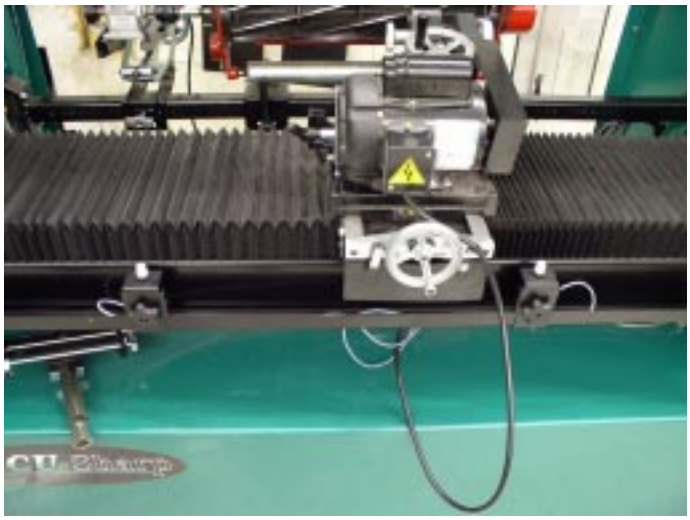


FIG. 62

FIG. 63

FIG. 64

GRINDING REEL INTO A TRUE CYLINDER BY SPIN GRINDING (Continued)

J. Set traverse speed knob to approximately "12", then turn on the traverse switch and begin grinding. If reel is in bad condition, traverse slower as more material can be removed. Conversely, if the reel is in good condition, speed can be increased.

MAXIMUM RECOMMENDED STOCK REMOVABLE PER PASS IS .008. NOTE: THE INFEED HANDLE IS CALIBRATED IN INCREMENTS OF .002 (.05 MM) ON THE RING SCALE LOCATED ON THE INSIDE OF THE INFEED HANDLE.

K. If grinding wheel is only making contact in one part of the reel, adjust the traverse stop so the carriage traverses slightly further than the contacted area. As you infeed and wheel makes full contact in this area, move traverse stop away 6 to 8". This will speed up the grinding process of getting a cone shaped reel into a true cylinder. See FIG. 65.

L. Spin grinding is completed when full contact is made across the entire length of the reel and the entire width of all blades and the cutting edge is sharp. It is required to have a sparkout to complete grinding the outside diameter to a true diameter. For sparking out, the process is to infeed the grinding head for approximately .002 (.05 MM) stock removal (one line on the ring scale) and let the grinding wheel sparkout. For sparking out in grinding process, always traverse the grinding head at least 20 passes with no additional infeed. Set traverse at slow speed on dial setting approximately 4 to 8 feet per minute range for final grinding sparkout. After sparkout, shut the grinder completely off.

NOTE: This process refers to sparkout, but what we are looking for is a near sparkout, approximately a 99% reduction in grinding sparks from normal grind. Do not run sparkout until you have no sparks because this could be an extremely extended period.

NOTE: Greatest accuracy and best finish is obtained when reel is sparked out. Use your set up gauge, prior to relief grinding to check the reels for roundness. This is very important when first learning the operation of your machine.

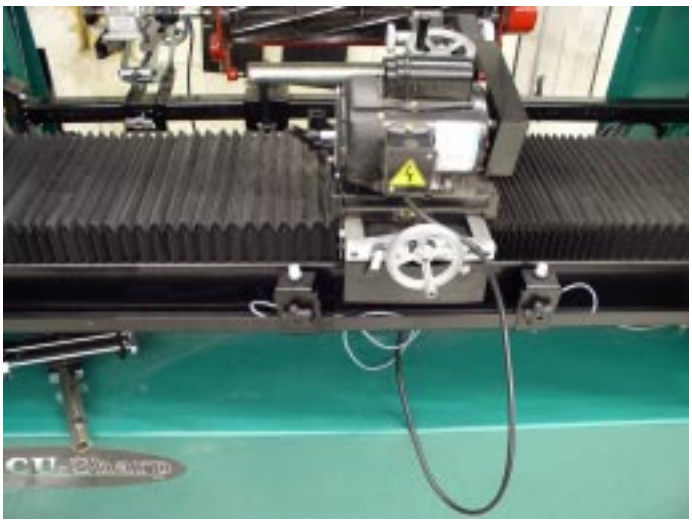


FIG. 65

M. Verify the reel straightness and roundness. Install the alignment gage. Index reel blade until you read the high point on the indicator. Now loosen the wing screw and set the indicator stop block to a 1/32" gap as shown in FIG. 57 & 58.

Mark this blade as #1 and set the large dial of indicator setting to "0", then check each blade for maximum and minimum reading.

Check each end of reel and at the center. After becoming familiar with the process, you will not have to check each reel.

IT IS VERY IMPORTANT IN SPIN GRINDING THAT YOU THOROUGHLY SPARKOUT AT THE END OF THE GRIND CYCLE. THE DIFFERENCE BETWEEN ACHIEVING .005 OR .003 TOTAL INDICATOR READING IS ACCOMPLISHED THROUGH PROPER SPARKOUT.

REEL SPIRAL OR HELIX

When standing behind the mowing unit when the mowing unit is sitting in normal position on the ground. If the spiral is such that the right side of the blade cuts before the left, it is a right hand lead in or a right hand spiral reel. If the spiral is such that the left side of the blade cuts before the right it is a left hand lead in or left hand spiral reel. Most reels made today are right hand spiral and are referred to as normal helix.

RELIEF GRINDING TO COMPLETE THE REEL GRINDING PROCESS

A. This ACCU-Sharp model 605 grinder is equipped with two grinding wheels and two grinding wheel guards. Prior to relief grinding install or verify installation of the 3/8" (9.5 MM) wide grinding wheel and the relief wheel guard which has the relief and index fingers attached. See FIG. 66.

B. Check to see if your mowing unit is normal or reverse helix.

NOTE:
As you look into the guide finger on **PAGE 38, IT SHOWS THE NORMAL REEL HELIX.** The high point of the relief finger is on the right hand side of the grinding wheel.

As you look into the guide finger on **PAGE 39, IT SHOWS THE REVERSE REEL HELIX.** The high point of the relief finger is on the right hand side of the grinding wheel.

Most mowing units are normal helix.

C. Reset the Traverse Limit Proximity Switch so the grinding wheel clears the reel at both ends by approximately 1/16" (1.5 mm) or the reel blade comes off the relief finger on the right side. See FIG. 69 - 72.

D. Set Grind Selector to variable torque relief. (**NOTE:** The Spin Drive Rotation switch must be in the **OFF** position when changing Grind Selector switch.) Set Spin Drive Rotation switch to rotate the reel into the stop finger, counterclockwise (CCW) when looking at the right side. **NOTE:** Relief torque reel rotation is always opposite spin rotation.

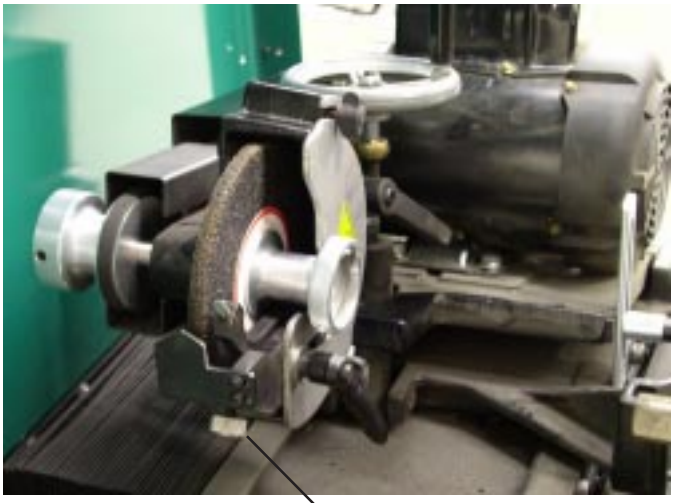


FIG. 66

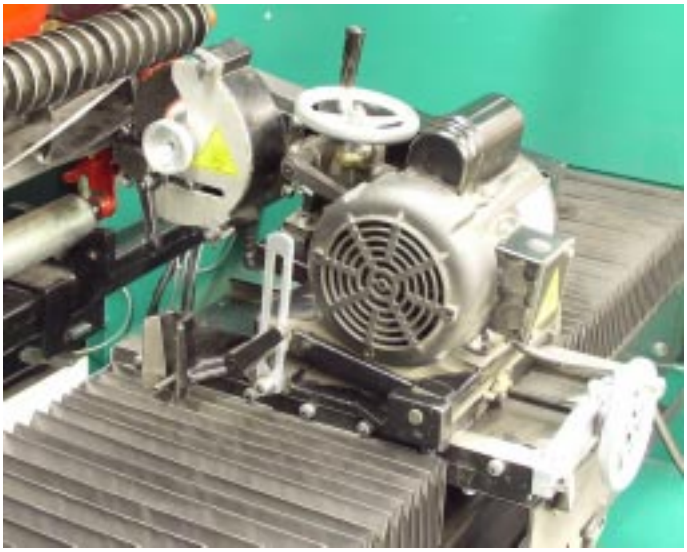


FIG. 67

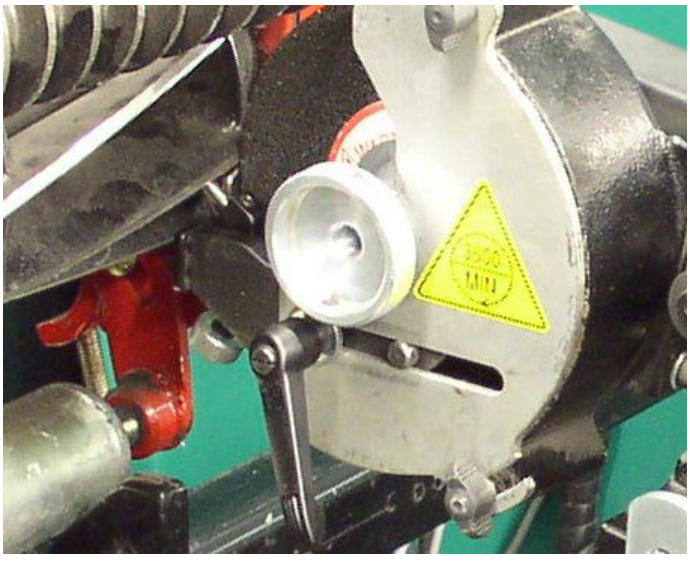


FIG. 68

REEL SPIRAL (Continued)

E. There are three (3) lock handles to loosen. Two (2) on the base for the adjusting arm locks and one for the grinding wheel vertical height adjustment lock. Raise the grinding head up approximately seven (7) turns so the reel blade can rest on the reel guide finger. It will be necessary to infeed the grinding wheel to accomplish this. See FIG. 67.

F. Now you can adjust the back angle you wish to put on the reel blade.
(The average recommended manufacturer's angle is 20 to 40 degrees. When in doubt, check with each reel manufacturer as to the exact angle required.)
By looking down the reel from the operator's position you can see the reel blade and its relative position to the grinding wheel. See FIG. 70. By raising the grinding wheel you will decrease the relief angle and conversely by lowering the grinding wheel you will increase the relief angle. Traverse the grinding wheel assembly to the right side of the reel. Re-tighten all three (3) lock handles.

G. The Index Finger position must be set to stop the reel blade and allow traversing to the left without the blade hitting the side of the relief finger. This position must also allow approximately 1/32" (1 mm) free play of the index finger when the blade is resting on the high point of the relief finger. See FIG. 68.

H. Turn the traverse speed pot to zero, then turn the traverse drive motor on. Using the speed pot to slowly move and stop the grinding wheel, jog left until the reel blade is on the relief finger.

I. Adjust the grinding head forward until there is minimal clearance between the reel blade and the grinding wheel.

J. Adjust the index finger positioning by rotating the back travel adjust knob on the away side of the grinding head. This position must allow approximately 1/32" (1 mm) free play of the index finger when the blade is resting on the high point of the relief finger. See FIG. 66 - 68.

FIG. 69

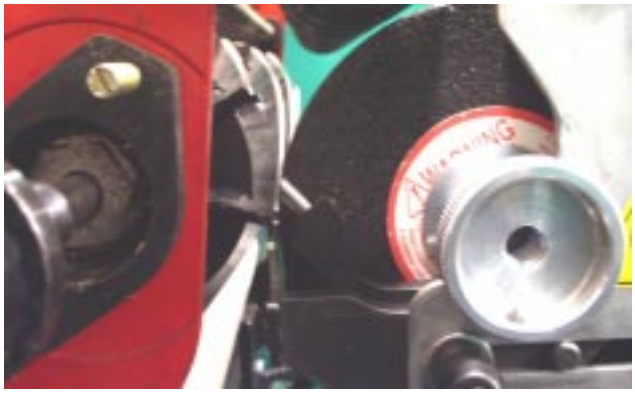


FIG. 70

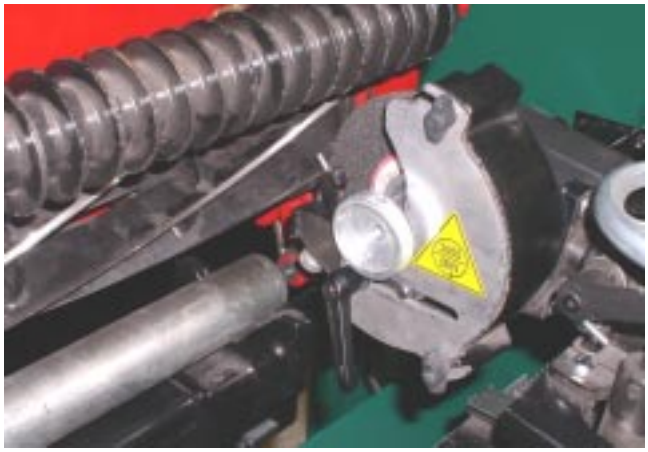
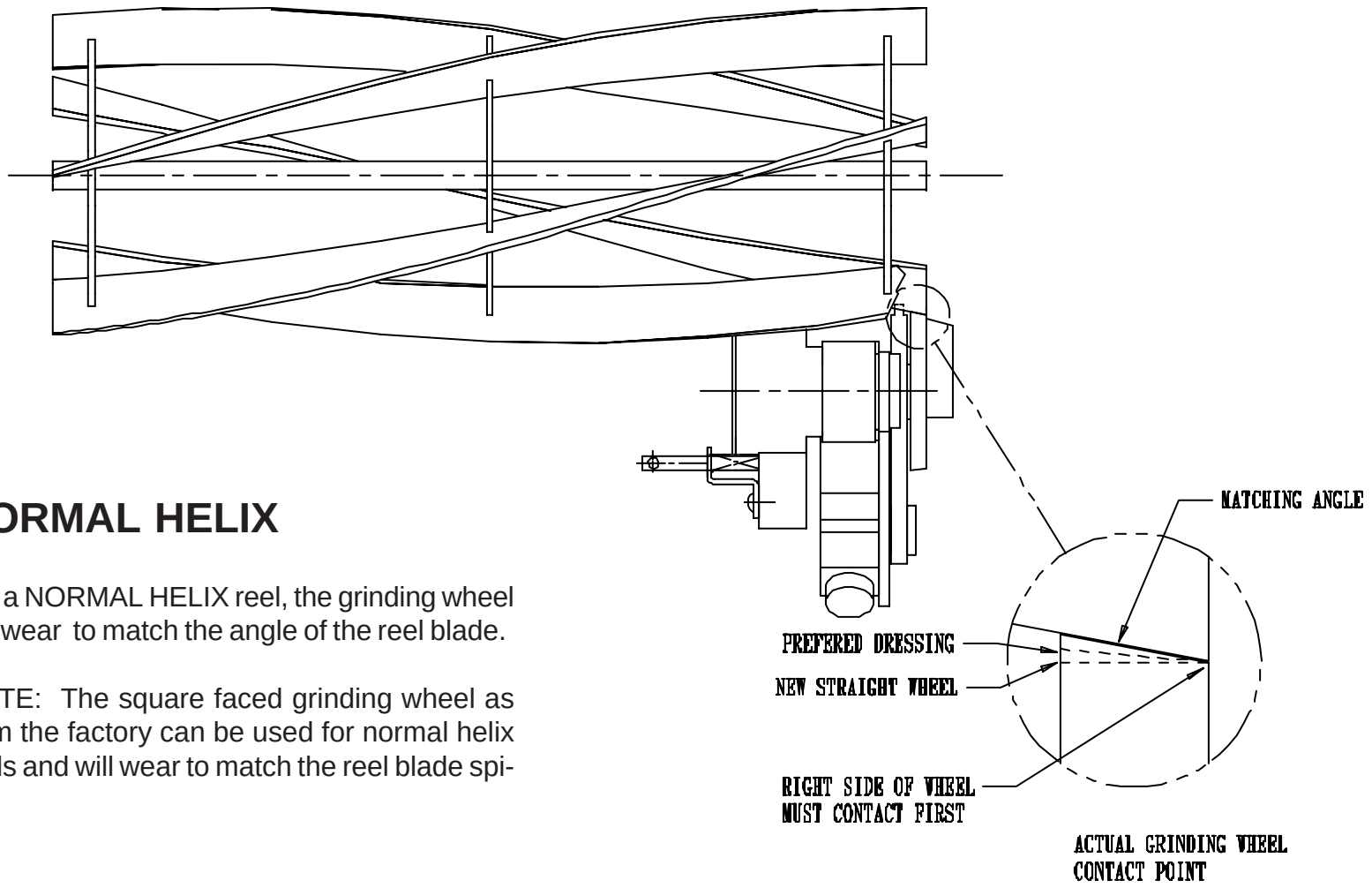


FIG. 71

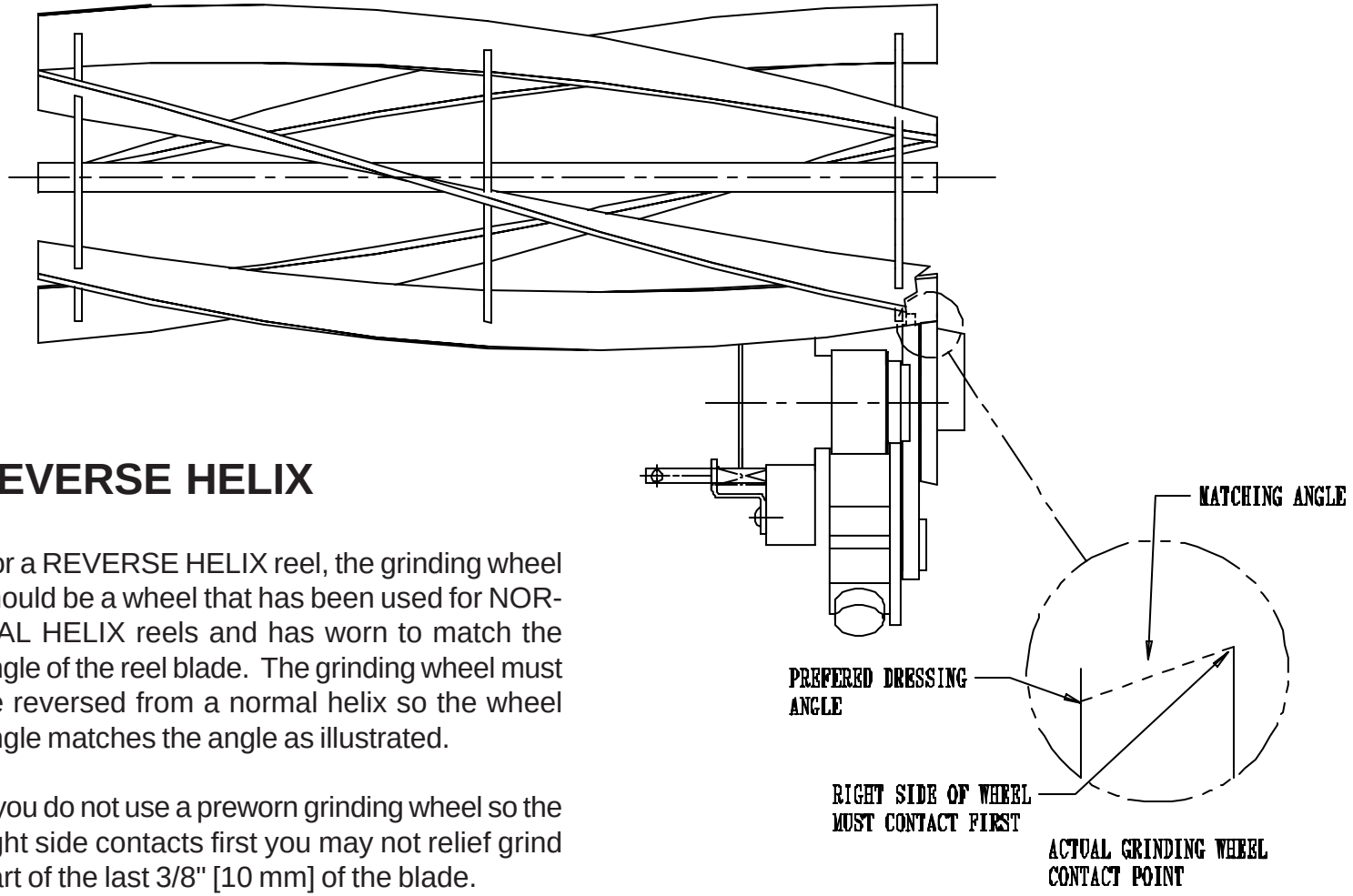
FIG. 72



NORMAL HELIX

For a NORMAL HELIX reel, the grinding wheel will wear to match the angle of the reel blade.

NOTE: The square faced grinding wheel as from the factory can be used for normal helix reels and will wear to match the reel blade spiral.



REVERSE HELIX

For a REVERSE HELIX reel, the grinding wheel should be a wheel that has been used for NORMAL HELIX reels and has worn to match the angle of the reel blade. The grinding wheel must be reversed from a normal helix so the wheel angle matches the angle as illustrated.

If you do not use a preworn grinding wheel so the right side contacts first you may not relief grind part of the last 3/8" [10 mm] of the blade.

NOTE: A wheel that has been worn to match a normal helix can generally be removed and reversed to grinder reverse helix reels.

OPERATING INSTRUCTIONS (Continued)

K. **CLOSE THE FRONT AND REAR GUARD DOORS**

L. Turn the Torque Potentiometer to zero. Turn the Spin Drive motor on.
NOTE: The spin drive will apply torque load against the fingers.
Slowly turn the Relief Torque Potentiometer up to approximately 15. **NOTE:** Free turning reels may need a lower value than 15. Stiff reels or reels with a drive train may need a higher torque than 15. Do not exceed 45 on the relief torque potentiometer setting.

M. Jog the traverse all the way to the left prox switch watching for proper clearance between the grinding wheel and the blade. When the grinding head reaches the left prox, the index finger should pop forward. See FIG. 70. The grinding wheel should come off from the reel blade, but the reel blade should remain on the fixed relief finger. See FIG. 69 Check for proper clearance between the index finger and the front side of the blade on the return trip to the home position. See FIG. 71. Also verify clearance between the index finger and the reel blade support spiders.

N. Stop the traverse in home position and check for a proper blade index. See FIG. 72. The traverse drive control is factory set with a two second dwell time before it reverses the carriage travel. This is to allow time for the reel to rotate and the index finger to catch the next blade. If necessary the dwell time can be adjusted (refer to Control Board Potentiometer Adjustments section on Pages 23 in the Assembly and Service Manual).

O. Allow the grinder to traverse down and back to verify everything is properly set up. Turn the traverse potentiometer to zero once the home position is reached.

P. Turn on the Grinding Wheel Motor.

Q. Turn on the traverse speed pot to a proper grinding speed. Slowly infeed the grinding wheel until you are able to grind the full length of the reel blade evenly. You can infeed between .005" to .012" at a time. Be sure you have ground all the blades before infeeding further.

NOTE: Traverse speed should be approximately 15 fpm. If you are removing a small amount of stock on initial infeeds, faster traverse speeds are suggested. If you are removing a large amount of stock on later infeeds, slower traverse speed may be required.

WHEN YOU HAVE SUCCESSFULLY COMPLETED THE SPIN GRIND AND RELIEF GRIND ON A GIVEN MOWING UNIT TYPE, THEN MEASURE AND COMPLETE THE SETUP CHART ON PAGE 41.

REEL SETUP CHART

Note: These dimensions will vary due to reel position in frame, reel dia., height of cut, roller position, etc. Use these values as a guide only.

REEL MAKE, MODEL & HEIGHT OF CUT	REAR TOOLING MOUNT TYPE	REAR TOOLING MOUNT POSITION	OVERHEAD CLAMP MOUNT TYPE	OVERHEAD CLAMP MOUNT POSITION	OVERHEAD CLAMP ROD DISTANCE	SPIN DRIVE POSITION	SPIN SPEED SETTING	SPIN SPEED SETTING	TRAVERSE SPEED SETTING	NOTES